A GERNSBACK PUBLICATION

# AIR WONDER STORIES

APRIL
1930
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HUGO GERNSBACK
Editor

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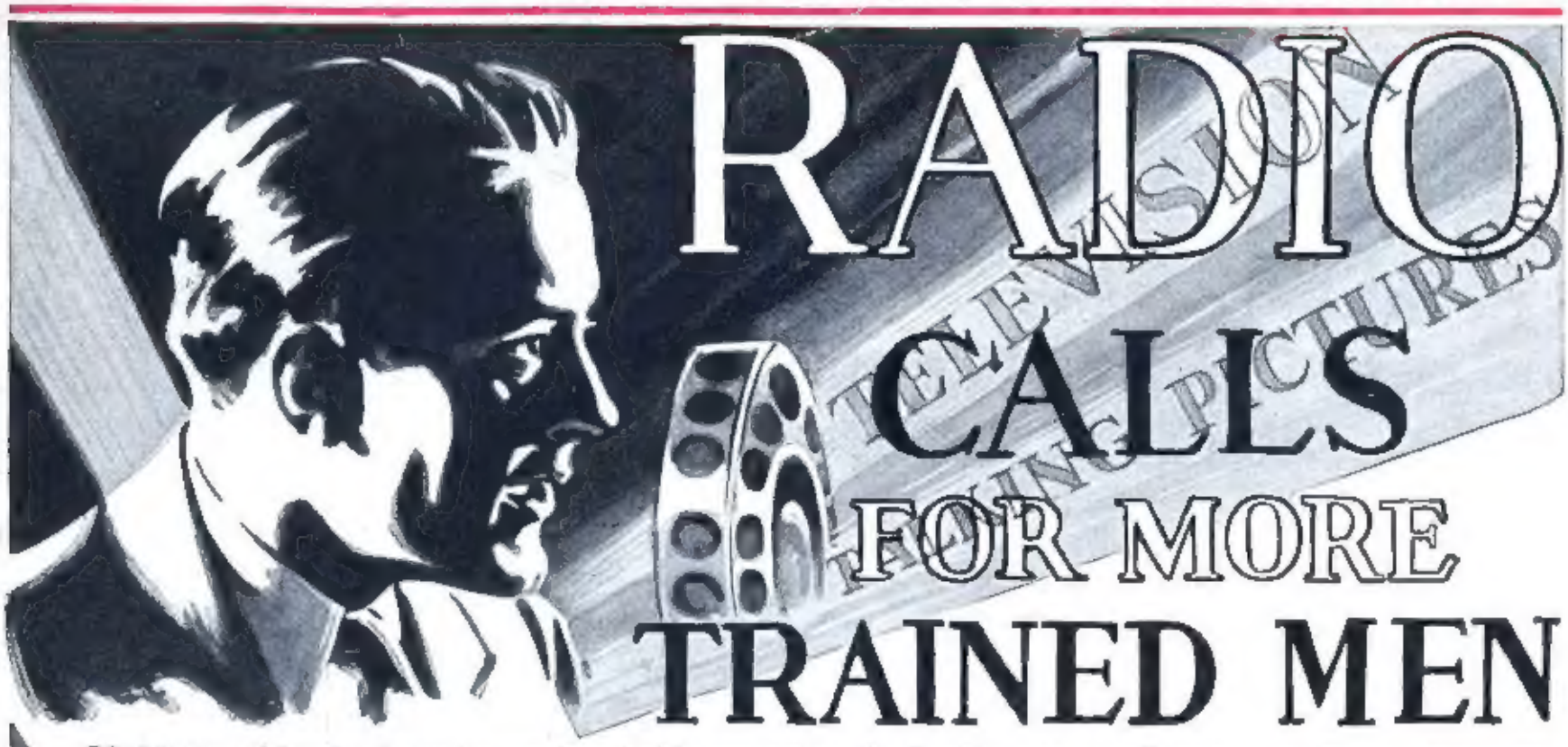


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## Table of Contents—April

THROUGH THE METEORS
By Lowell Howard Morrow.....870
*From far-off Jupiter came the attacking hordes. . . .*
THE HEAT RAY
By O. L. Beckwith.....890
*With this terrible weapon the world lay helpless. . . .*
THE FLYING BUZZ-SAW
By Harold McKay.....898
*The fate of the North American Federation hung in the balance. . . .*
EVANS OF THE EARTH-GUARD
By Edmond Hamilton.....903
*In the great emptiness of space, the Earth-Guard pursue the elusive Hawk. . . .*
THE METEORIC MAGNET
By Moses Schere.....908
*By an accident the great secret was discovered and just in time. . . .*
THE FLYING LEGION
By George Allan England.....914
*Trapped by their enemies, the Legion battle for their life. . . .*
HOW HIGH CAN MAN FLY?
By Lieutenant Apollo Soucek.....940
AVIATION NEWS OF THE MONTH.....944
AVIATION FORUM.....945
THE READER AIRS HIS VIEWS
Letters from Our Readers.....946

### *On the Cover This Month*

is shown a flying buzz-saw of the North American Federation (from the story by that name of Harold McKay), ripping through an enemy plane as cleanly as a knife cuts through cheese. In the background another enemy plane is plunging to earth after having been caught by the devastating buzz-saw.

## NEXT MONTH

**WOMEN WITH WINGS,** by Leslie Stone. The versatile author of "Men With Wings" gives us now, in this marvelous sequel, the further adventures of a race of winged people. There is no doubt that all of us, as we watch the birds on their flights through the sky, have wished that we were winged and could leave the surface of the earth when and as we wished. What if that could happen and we became a race of winged beings? What a different life we might lead! And then suppose there were the complication of an invasion of the earth by beings from another planet? That might make a most thrilling story, you would say. And it does.

**THE SKY RULER,** by Ed Earl Repp. As a writer of adventure tales that carry you along breathlessly from page to page, Mr. Repp has few equals. The present story is one of his best. It combines not only excellent imagination, and stirring adventure but also an ending so surprising that no one will suspect it until he has finished the story. Who is the mysterious Sky Ruler, you will ask? Who is the man with strange powers who can hold a world at bay? The secret mystifies the world and the answer is not known until the story is finished.

**THE AIR TRAP,** by Edward E. Chappelow. The airplane has done one notable thing if no other—it has opened up to man vast areas of untravelled, unknown lands. And those aviators who have at the risk of their lives, charted the air lanes over these vast deserts and jungles are the true pioneers of the century. Many of them have met with experiences stranger than anything we can suspect and few ever return to tell us about them. But whatever any aviator might have seen or met, certainly nothing could have been stranger than the "air trap" that Mr. Chappelow writes of—the trap from which few escape.

**THE ESCAPE FROM THE ARCTIC,** by Walter Kateley. Suppose you were ice-bound in the great Arctic wastes; and certain death faced you. Perhaps, in your moments of madness, a great idea might come to you that would mean your salvation. In this astounding air story Mr. Kateley shows indeed how "necessity is the mother of invention."

**AND OTHERS.**

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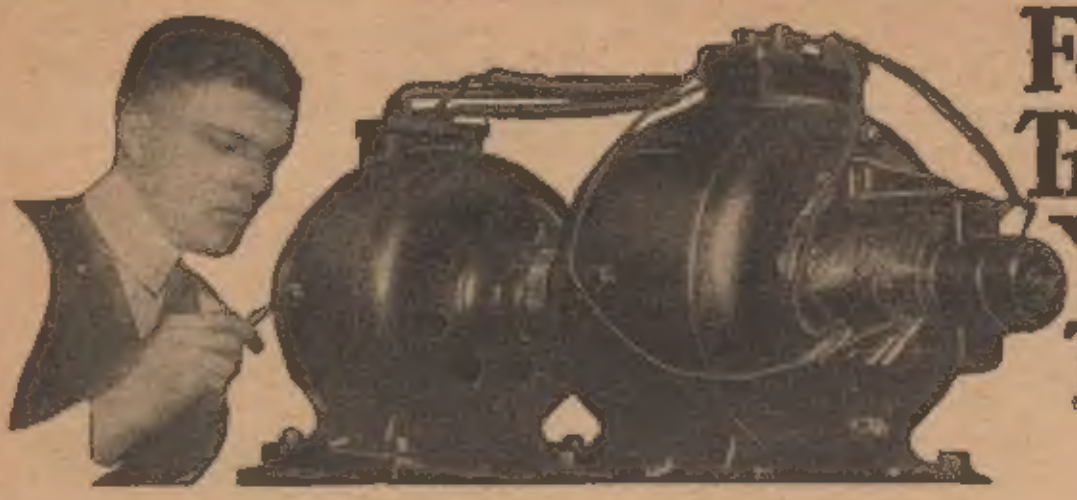

# Fellows I Have Trained Will Tell You That You, Too, Can Cash In On

# ELECTRICITY

## Not By Correspondence

"First I enrolled with a School teaching Electricity by correspondence. I tried to work out several lessons, but quit when I saw your ad. telling how you taught Electricity by actual work. I didn't have much money when I went to Coyne, but through your Employment Department I was able to work for my room and board. Three days after graduating you got me a good job with a Battery and Electric Shop, and a year later I bought a Shop of my own. I now have a $1300 car and a thriving business—all paid for."

George W. Stoneback, Illinois.

## Lands a Job at $8,000 a Year

"Before going to Coyne, I was an ordinary mechanic. Now I make $300.00 a month, and am accepting a new position the first of the year as Chief Electrician at $8,000 a year. Any man who works for me will have to be a Coyne graduate."

Stanley Zurawski, Michigan.

## From $20.00 a Week to $100.00 a Week

"Before going to Coyne, I had worked in a garage for five years at $30.00 a week. I had no advanced education and didn't know a volt from an ampere. Yet I graduated in three months with a grade of 98%. Since I left Coyne, I have jumped from $30.00 to $100.00 a week, and am still going strong. I owe all my success to the practical training I got in the Coyne Shops."

Harry A. Ward, Iowa.

"I knew nothing about Electricity, before I went to Coyne," says Nolan H. McCleary. "I had no advanced education and so little money that I could never have stayed at school, if Mr. Lewis hadn't gotten me a part-time job. Yet I finished the course in twelve weeks, and the School immediately placed me in a fine electrical job. Now I am Chicago District Manager of the largest electrical concern of its kind in the world, making more money than I ever dreamed of making before I went to Coyne. I am convinced that there is but ONE RIGHT WAY to learn electricity and that

NOLAN H. McCLEARY
*Chicago District Manager, Beardsley-Wolcott Co.*

is the way of the Coyne School—BY DOING ACTUAL ELECTRICAL WORK YOURSELF UNDER EXPERT INSTRUCTORS, ON FULL-SIZE, RUNNING ELECTRICAL MACHINERY AND EQUIPMENT."

For thirty years Coyne has been training men for responsible, Big-Pay electrical jobs—NOT BY BOOKS OR CORRESPONDENCE, but by an amazing way to teach that makes you a practical Expert in 90 days. You need no advanced education or previous experience. I don't care if you don't know an armature from a generator; if you're sixteen years old or forty. IT MAKES NO DIFFERENCE! I will prepare YOU for a fascinating, Big-Pay electrical job in twelve weeks time. I will allow you your railroad fare to Chicago—help you get part-time work while at School—and give you every assistance in locating just the job you want when you graduate.

## Says You Can Make $60.00 to $200.00 a Week

"Before going to Coyne, I made thirty cents an hour. I borrowed the money for my tuition and you got me a part time job that took care of my expenses. I graduated in twelve weeks, returned home and started doing wiring on contract. In a year's time, I had paid for my schooling, bought a car and had a nice shop of my own. In your catalog you say a fellow can make $60.00 to $200.00 a week. I have done better. In July I made $150.00 to $200.00 a week, and I have made as high as $75.00 a day."

Joseph F. Hartley, West Virginia.

## His Advice—"Go To Coyne"

"Some fellows try to learn Electricity by just working at it. Others send away for correspondence courses in it. But my advice to anyone who really wants to learn Electricity is TO GO TO COYNE. They have all the electrical equipment right in the school that you will ever see in the field. NO PICTURES OR USELESS THEORY. They show you just how to do everything you will have to do on the job."

R. M. Ayers, Louisiana.

## Nothing Compares to Practical Training

"Before going to Coyne, I took a correspondence course in Electricity, but it was too deep for me and I lost interest. Then I got your catalog, saw how you let the student actually work on electrical equipment, and decided to go to Coyne. At that time I was only making $9.00 a week. Now I make $66.00 a week straight time, have a Hudson car and own my home—where before I could hardly pay rent."

D. G. Emerson, Michigan.

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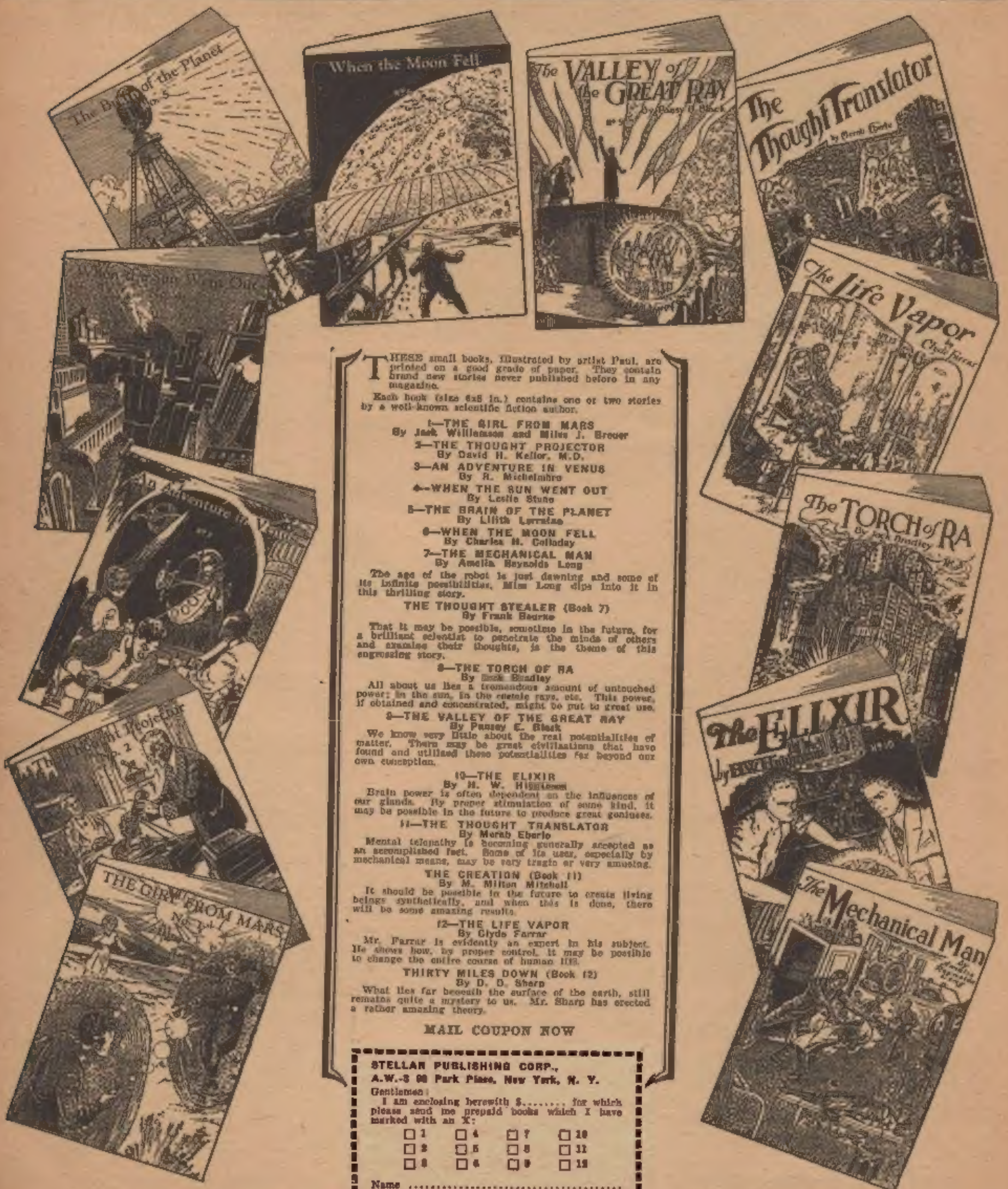


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APRIL
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These aeronautical experts pass upon the scientific principles of all stories

# STATIONS IN SPACE

By HUGO GERNSBACK

ONE of the common misconceptions of the average man, or the layman, about the science of space-flying, is that, in order to hover above the earth, it would be necessary to choose the exact point where the gravitational fields of the earth and moon balance (about 216,000 miles above the earth, and 22,000 miles from the moon). This is an erroneous idea, however; for it is possible to fly continually around the earth without the expenditure of any power in doing so. Once a space-flyer has been given a sufficient initial impulse, it can keep on going forever, comparatively close to the earth's surface, without danger of falling.

Impossible as this may seem, the statement is perfectly true. It will be necessary only to build a rocket ship and elevate it beyond the appreciable atmosphere of the earth—say a trifle over five hundred miles—then give it a sufficient impulse in a direction at right angles to the position of the earth. It will then continue to gravitate around the earth without falling; thus becoming a new satellite; and it will maintain its orbit permanently until it is disturbed by some external force. Of course, at such a distance, it is to be supposed that no atmospheric friction will be encountered to reduce the original speed—which must be in the order of five miles a second. This is rather low, as planetary velocities are considered. Once the space flyer has reached the critical speed, it will continue to revolve around the earth—in a period of less than two hours at this distance—exactly as the moon now revolves about us, and without the need of added propulsive force.

It might be asked: what useful purpose would be served by converting a space-flyer into a permanent, rapidly-revolving satellite of the earth in this manner?

Professor Hermann Oberth, perhaps the greatest authority on interplanetary space, points out many uses for such revolving "space stations," as he calls them. A better word, perhaps, would be "revolving space observatories."

In the first place, from such a height, it will be possible to make any amount of astronomical observations in free space without having to worry about clouds or the interference of the atmosphere. Marvellous photographs can thus be taken, not only of distant stars and planets, but of the earth's surface as well.

One important purpose, as Professor Oberth points out, is the invaluable aid that such an observatory can give to the science of meteorology, or weather prediction, as it is more popularly known.

If the observatory is equipped with radio, instantaneous communication can be had with the various meteorological stations scattered all over the earth and, if there are a number of such observatories circling around the earth (let us say four or eight), they can immediately notify any station on earth as to probable weather conditions. Movements of clouds; fog formations; icebergs, etc., can be immediately reported. If there had been such observatories years ago, one could have prevented the sinking of the *Titanic*, because the ship could have been notified by the circling observatory of the dangers in its path. Such dangers can be spotted much more quickly from above than from the surface of the sea, particularly when there is a thin layer of fog intervening on the sea.

Most of our bad weather is created in the polar regions. It is practically impossible today to know what is brewing in these regions, because they are too extensive to cover with fixed weather stations. But circling observatories, such as Oberth proposes, would notice immediately the breaking up of ice, formations of new ice, pack ice, etc.

Equipped with powerful telescopes, at a distance of 500 miles above the surface of the earth, it would be a simple matter for the scientists in the observatory to spot even smaller objects, such as airplanes. The circling observatory, for instance, would have been in position to watch the tragic flight of Nungesser and Coli across the Atlantic in 1927, and could have given, instantaneously, a report of the exact spot where the plane came down. Expeditions into deserts and into polar regions, as well as into unexplored regions at any place on earth, could thus be easily watched and reports of their progress given instantly.

Such circling observatories can be manufactured at a cost much less than that of even a small cruiser; and the benefit that humanity would derive from such satellite observatories would pay for the investment in short order.

Of course, it would not be necessary for the observers to remain aloft permanently, as they could be relieved at any time by means of smaller space flyers. All that would be necessary is for a rocket-propelled ship to lay a course parallel to the observatory; after which the space ship can be made fast to the observatory. Then after an air-tight connection is effected, exchange of personnel can be made without trouble.

The benefits given above are only a few of those afforded by circling observatories. There are a hundred other important ones, which will easily suggest themselves; and we may be sure that, because the great importance of such space observatories, we will see them in use during the present century.

# THROUGH THE METEORS

By LOWELL HOWARD MORROW

*(Illustration by Paul)*

**"I saw one of the black monsters burst into flame and blow up with a detonation whose soundlessness was more terrific than any noise"**

# THROUGH THE METEORS

## *By the Author of "Islands in the Air," "The Air Terror," etc.*

NEVER shall I forget that warm Fourth of July night in the year of our Lord 2008. The fact that I was strolling over my Adirondack estate beside my friend Doctor Halpin—one of the most eccentric and most lovable of men—would alone have sufficed to fix it in my mind. But it is that gigantic spectacle in the sky, that has set its imprint on my memory.

I even remember the hour, for the ten o'clock aerial express from Montreal to New York had just streaked past when Halpin, who was always star-gazing when out on a clear night, suddenly gripped my arm hard and pointed toward the western sky. Far up in the heavens appeared a great elliptical ball, glowing a dull red which increased rapidly in brilliancy as it raced east like a monster chariot of fire.

Halpin was not easily startled, but as I gave him a swift glance I saw his long, lean jaw sag in amazement, while his dark eyes opened wide.

"That's the largest meteor I ever saw!" he exclaimed. "Now the meteor of 1866 was—"

His voice died in a gasp, for suddenly the giant fire-ball burst directly overhead, filling the sky with dazzling fire and flooding the earth with a weird golden light. This was followed almost immediately by terrible, rumbling detonations, like the bellowings of a thousand cannons, as the fragments burst asunder and scattered over the sky in a shower of pulsating flame and sparks.

"Can you beat that now?" Halpin asked as the giant sparks finally died and disappeared over every point of the compass.

"Thank God for our protecting atmosphere," I answered. "If that baby had ever hit this old globe it would have jarred things up a bit. I—"

We caught our breath, for there was another surprise in store for us. Far down the slope of the hill, on whose bare top we stood, we heard the pummel and rattle of something falling among the trees and bushes. It sounded like the patter of hail on an iron roof, and a moment later a shower of minute particles, accompanied by clouds of dust and ashes, fell all about us. The glow in the sky still lingered, dying slowly away as the stars blinked through the haze. But the light on the earth was terrifying and awesome as it slowly merged with the shadows of the night.

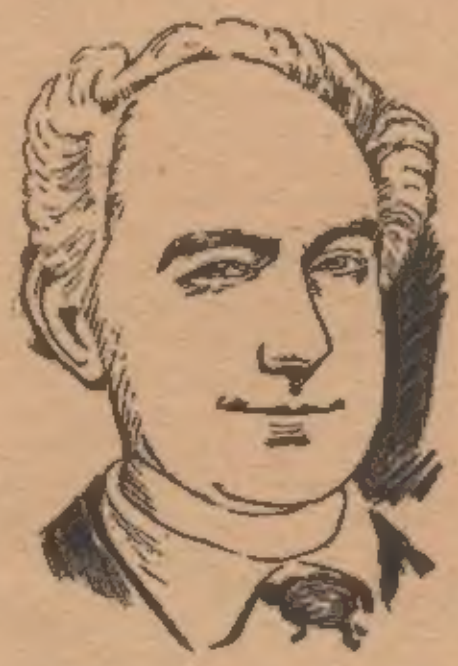
I danced about and looked for shelter, though I knew none was available. I had no mind to have my head bashed in by one of those messengers from space. But Halpin was laughing at me. He held his ground and stared up into the dust-filled air.

"You might as well stand still, Zane," he laughed. "It would be just as easy to dodge a bolt of lightning!"

Even as he spoke the shower of missiles ceased, the air cleared, and the peculiar glow faded from the sky, leaving no trace of the fiery visitor that had just dashed to its death.

"It must be that even the angels are getting patriotic for Uncle Sam," I remarked.

HALPIN made no reply. With his tall, spare form bent low, his long coat-tails hanging down grotesquely, he was searching the ground, his flashlight playing over the gray dust that had just fallen. He was looking for specimens, and I did not disturb him. However, I was anxious to go back to the house to learn the opinions of other astronomical savants of the northern hemisphere who must have witnessed this phenomenon of nature. That we had just beheld the explosion of the largest meteor ever seen by man I did not doubt. I thought of the frightful consequences had this monster reached the earth and fallen into one of our large cities, and I could not repress a shudder. But as Halpin was my guest, having come up from New York to spend the week-end, I could not hurry him nor bother him with my remarks until he had completed his search. As he continued to poke about I kept casting my eyes heavenward, as though I momentarily expected another fire-ball to burst above us.



LOWELL HOWARD MORROW

*SERIOUS scientists agree that one of the most important of the obstacles that will retard interplanetary flying is the menace from meteors. These space-wanderers, pursuing orbits from Jupiter to the sun and crossing the orbit of the earth, remain as a more or less permanent hindrance to interplanetary flights. Travelling with speed from 6 to 30 miles per second, these bodies range in size from a pea to a good size house and could puncture any space flyer that we could build with our present equipment.*

*Mr. Morrow gives us even more difficulties: a permanent curtain of meteors surrounding the earth completely. And if such a situation were to come to pass, which is not at all impossible, there is no doubt but that science will have to devise some instrument, based on new principles in order to combat these space-wanderers.*

*Mr. Morrow gives us even more difficulties: excellent; and a meteor curtain, such as he suggests might well be a means of defense for our planet, as well as an obstacle to interplanetary flights.*

For perhaps fifteen minutes he continued his search while I watched him impatiently. Then I saw him stoop suddenly, seize something in his hand, and, with the furtive motions of a thief, hastily convey the article to the inner depths of those long coat-tails.

As he straightened up and turned toward me there was an odd expression on his thin, angular face, an expression of amazement, delight and satisfaction. I was burning with curiosity to know what he had just found and placed in his pocket, but I knew better than to question him. He would tell me in good time.

"Big chunks of that fellow must have hit the earth somewhere," I said. "God! wasn't he a monster? Fancy a space flyer meeting such a giant rover of the sky!"

"Just imagine it," returned Halpin.

"I believe that was the largest meteor that ever struck our atmosphere," I went on. "No doubt it was some such flaming rock that was responsible for the death of Professor Moltsi and his companions and the destruction of their space flyer."

"It is probably true that we have just seen one of the largest meteors ever known," Halpin said as we strode down the hill toward the house. As I looked at him, again that inscrutable smile hovered about his lips. "But as I have remarked before, no such large body ever brought Professor Moltsi to grief. He could have side-stepped such a formidable thing. What the space flyer has most to fear is those swarms of meteoroids—millions of them no larger than a marble or a pin-point—that surround the earth and close it in like a gigantic, moving curtain. These celestial missiles plunging along at the incredi-

ble speed of seven to twenty miles a second at a distance of a hundred to a hundred and fifty miles above the earth, constitute the greatest menace against successful space flying. You might say that man is imprisoned by them: that nature has set them about the earth as sentinels to keep man from roaming off into space and thus destroying himself."

I nodded. From talks we had had together, I had learned from Halpin, how, starting in the fourth decade of the twentieth century, a change had been observed in the meteors crossing the earth's orbit. It was found that a great stream of them was approaching close enough to us and at such a speed that they might be captured by the earth as satellites. This, in effect, happened. Year after year the number of small and large fragments of matter circling the earth in a closed orbit increased until, at the dawn of the new century, the globe was practically protected by a shell of hundreds of thousands of swiftly moving meteors.

"Then I am to understand that you still consider the problems of interstellar flight insurmountable?"

"By no means, my dear Zane," he replied, glancing up at the stars with a self-satisfied air. "The problem of space flying will become perfectly simple, once we get beyond the curtain."

"That is to say beyond the meteors?"

"Exactly, my dear Zane. We must learn to avoid the fate of poor Professor Moltsi and his gallant men."

"But if the meteoric curtain is so dense, how have we succeeded in plunging through it with a rocket to the moon?" I asked.

"We must remember that these space wanderers move with tremendous speed," Halpin answered enigmatically, as we reached the house.

### A Losing Battle

ONLY the year before, Professor Moltsi, in a space flyer built along the lines suggested by the famous student of space flying, Captain Herman Noordung, had set out on an interstellar flight. The next day his great ship, which had cost millions to build and equip, was found, a broken, twisted, perforated mass of wreckage, on the steppes of Siberia. That meteors had caused the tragedy no one doubted. But the actual story remained a mystery, for every one of the brave men was dead. Still, this calamity did not quench the ambition of man to fly to other worlds. At once steps were taken to provide funds for the construction of another space flyer.

Doctor Halpin fought the movement. Unaided and alone, he appeared before committee after committee and argued against it. He tried to convince the enthusiasts that they could never get beyond the meteoric curtain; that this curtain would surely attack and destroy them. He begged that they give him time for exhaustive research and study of the problem before again risking lives and fortunes in a battle with those merciless, hurtling missiles of the sky.

Now despite the fact that Halpin had an excellent reputation as a brilliant scientist, he was laughed at, ridiculed and scorned by the promoters of the next interplanetary flight. So, swallowing his disappointment and shaking his head sadly, he secluded himself in his laboratory.

Doctor Halpin had few intimates and no relatives. Although he was a warm-hearted man to those who had broken through his scientific reserve, he had the reputation of being cold and distant. Well past forty at the time of our story, he did not show his years. His early manhood had been spent in a medical college, but he soon abandoned medicine for an experimental laboratory where, by means of numerous little inventions and discoveries, he was able to eke out a living.

ALREADY the radio was carrying a description of the meteor's invasion as we entered the living room. The servants—all of whom had seen the flying fire-ball—were clustered around the loud speaker and gazing in awe at the television screen which showed an excited professor at the Yerkes Observatory trying adequately to describe and explain the visitor.

Halpin settled himself in the depths of an over-stuffed chair, drew up his long legs, and, complacently folding his arms across them, smiled condescendingly as the words filled the room. Interested as I knew him to be in all branches of science, especially that relating to meteors, their habits and composition, I was at a loss to understand his attitude, his coolness and unconcern over what the whole world acclaimed the mightiest celestial spectacle ever recorded. Confound him—he was always that way! There were so many pertinent questions that I wanted to ask, and must repress until he deigned to converse with me.

As we listened, the professor explained that the great telescope of the Yerkes Observatory had picked up this wanderer a fraction of a minute before it burst asunder. It had suddenly appeared, apparently from nowhere, a long, dark, egg-shaped body, moving with great speed. The observers had been amazed to see so large a body explode and disintegrate so rapidly without showering the earth with many huge fragments. The height of the meteor above the earth's surface was computed to have been about one hundred miles, and its speed about one mile per second, which was very slow for such a traveler. But this was explained by its great weight and the checking of its velocity when it struck the earth's atmosphere. All of this seemed to be lost on my friend. He sat staring at the television screen and the radio with a bored air, and that blamed mysterious smile remained as a fixed symbol of his attitude toward life.

The following days were times of great excitement and discussion. We learned that everybody was reading astronomy. All the bookstores were soon sold out, said the radio announcements, and publishers were being besieged for new editions. Night and day the skies were swept by all manner of telescopes, large and small, as people sought new data on meteors and their kind. But nothing new was discovered. The meteor trains seemed not to have changed their course, nor could any unusually large body be detected among them. Several eminent astronomers—among them the celebrated Dr. Loyal of Mt. Wilson Observatory—predicted the early advent of another sky giant and that almost any night we might expect a heavy meteoric shower to blaze from the sky. Why these prophesies were made I do not know. Certainly there seemed to be no sound scientific basis for them.

So far as could be learned no harm had been done by the meteor. Yet it took a fortnight for the excitement to die and for people to resume the even tenor of their lives.

## CHAPTER II

### A Plan

NOT having heard from Halpin since that memorable Fourth of July night, I flew to New York toward the end of the month in the latest model radio-electric plane,* only to learn that he was shut up in his laboratory and refused absolutely to see any one. I sent in word by his old servant, Max, confident that he would see me. Imagine my chagrin and surprise when Max returned with the curt announcement that even I must curb my impatience and wait until Halpin was at liberty to see me.

Disappointed and somewhat hurt, I flew back to my mountain home. Never before had I been unable to obtain an interview with him, no matter what the circumstances. Indeed, I was vain enough to consider myself his closest friend, having known him for many years, and having nearly always been in sympathy with his point of view. It had been my privilege

* Devised by Wilkins in 1973. It derived its power from over a radio beam, thereby elliminating the necessity of a heavy power plant. It was, of course, still propeller-driven.

to help him out of many financial difficulties and to champion his cause when all others refused to listen to his odd schemes. I knew, therefore, that he must be burdened with some extraordinary problem to refuse me an audience. And I marveled what it might be.

Two more weeks dragged by, with nothing to occupy my time other than puttering about on my estate. One day I was seated in the living-room with my eyes on the television screen where scenes of the new space flyer were being pictured and explained. It was announced that the ship would be in readiness for an interstellar journey within six months, and everybody was agog with conjecture and wonder. The announcer was explaining the functions of the wonderful motors, when I heard a little chuckle in back of me. I turned to see Halpin standing behind my chair. That was a way he had. Without speaking, but smiling broadly, he flopped down in a chair and fastened his eyes on the screen.

"See here, old man, what the blazes was the big idea of your refusing to see me the other day?" I greeted him, severely.

Halpin took out his cigarette case and with provoking slowness lit one. Then he took a leisurely whiff, without once removing his eyes from the screen.

"Business, my dear Zane," he replied finally.

"I see," I said shortly, not satisfied.

"I was looking for a great secret of nature," he went on, deliberately. "And I have found it."

"Explain yourself, old man," I encouraged. I knew by his manner that he had discovered something big.

"Those damn fools are bent on destruction," he said with a contemptuous wave of the hand toward the screen. "They can never break through"

"Break through?" I echoed, wonderingly.

"Why—yes—through that dense curtain of meteors. They stand as much chance as a feather would of going through hell without getting singed. I tell you, Zane, there ought to be some way for the government to stop such harebrained fools from committing suicide!"

I stared. Never before had I heard him use such language. But I saw that he was terribly in earnest. He rose, went over to the grate and tossed his half-burnt cigarette among the ashes. Then with a gesture of impatience he switched off both the radio and the television.

"Enough of that stuff," he said, spreading his long hands deprecatingly. "That twaddle will do for children, but today, Zane, you and I are to discuss the world's most serious problem with the wisdom of men."

WHILE I continued to stare, Halpin resumed his seat and gazed down at the floor.

"I take it you've discovered a way of breaking through the meteors," I ventured, presently.

"I have."

"And the method—?"

"Remains a secret for the present. I may as well state at once, Zane," he continued as he lifted his eyes to mine, "I'm here to ask a great favor, and if you love your race I'm sure you'll be glad to grant it"

"But why does the welfare of the race depend on breaking through the meteor stream?" I asked. "Surely, when we get right down to hard facts, the world doesn't need space flyers."

"Your reasoning is superficial, man," he reproved. "And, besides, think of the rights of science. Then, too, as long as those fools are bound to venture forth into space, it's our duty to safeguard them."

"Then why not give your secret to them?"

"You know very well, Zane, that they wouldn't listen," he said bitterly.

"Very true," I agreed. "But just what do you propose to do?"

"I intend to build a space car that will go through the curtain."

"I see," I commented dryly, as the light began to break. "You want me to finance it."

"Certainly," he returned frankly.

"And the cost?"

"Oh, around a million," he replied, as calmly as though the project called for the expenditure of a dime.

"That's quite a large sum. Do you really think the venture would justify the expense?"

"Justify it?" he cried, springing up and pacing back and forth in his characteristic manner. "You know, Zane, that I'm not the man to suggest the outlay of such a huge sum were I not perfectly sure that the cause of humanity would be advanced thereby."

I was sure that he was right about that, but he had me puzzled. For the first time in our long and intimate friendship he was keeping me in the dark. I remembered that he had not yet divulged the nature of the article which he had picked up the night of the Fourth. Then there was his refusal to see me in his laboratory. I confess that that refusal still rankled. I could not understand him, and although I could easily spare the money, I was loath to invest it in such a hazardous enterprise unless he would take me into his complete confidence.

## Further News

SOMETHING impelled me to reach over and turn on the radio, and as I did so Halpin glared rebelliously.

". . . announcing from Mt. Wilson Observatory," came a voice in clear cut tones. "We have the honor to report that our telescopes have just disclosed in the northern sky three especially large meteors, traveling over one hundred miles above the earth's surface and about three hundred miles apart. These giants of the meteoric field, oval in form, are moving at a high speed and pursuing an erratic course south-east by east. They loom darkly against the mass of lesser meteors about them and have all the appearance of the large body that last summer exploded above New York State. They were under observation but a fraction of a minute and were soon obscured by clouds.. The coming of these large bodies into our meteoric system is puzzling. It is suggested by Professor Stone that they may be itinerants, wanderers of space, which, coming within the gravitational pull of the earth, have been caught in the meteor swarm and deflected from falling on our globe. If this theory is correct it is very fortunate, for should such a monster strike the earth the consequences would be appalling."

The announcer ceased speaking but, for a full minute afterward, Halpin sat staring at the radio, his jaw sagging. He looked like one in a trance.

"God!" he exclaimed at last. "Think of those poor idiots running against such things!"

"But you once said that it is not the large meteors that are particularly dangerous to space flyers," I said reflectively.

"Very true, Zane, they could be seen and dodged. But there are—" He paused, gazing at me speculatively, an odd light in his eyes.

"But isn't it curious, Zane! Before the earth became enclosed in this veritable shell, few people thought seriously of interplanetary flights. But now that nature has seemingly put a permanent obstacle against our leaving the earth's atmosphere, any number of damn fools won't rest content until they accomplish the feat."

"Then you think that nature played us a dirty trick by placing the meteor curtain about us?" I asked.

"Not altogether," Halpin said suggestively. "You see, a barrier acts both ways."

Attempts to get him to explain his statement proved fruitless, so I took another tack.

"It strikes me, Halpin, that these tramps from space may be the forerunners of a still larger space tramp; that one of

these days this old ball is going to collide with it and be smashed to smithereens."

"That is one of the possibilities," he acknowledged. "And that is one of the great reasons why we should guard against such a catastrophe."

"Yes—but in what way?"

"Simply by building a super space flyer, getting through the curtain of meteors with it and making a study of space conditions above our atmosphere."

"And can you do that?"

"Most assuredly I can," Halpin replied, confidently. "Believe me, Zane, we've simply got to get out there in space to protect our interests."

"Our interests? You are keeping something from me," I said reproachfully. "If you want me to furnish funds to build this great air car of yours, why not take me into your confidence?"

"I dare not, Zane," he answered frankly. "If I did, you would not let me have the money, for my scheme is so wild and visionary that even you would not care to back it. But I want to assure you that my work will be based on exact scientific knowledge—which I must keep to myself for the present—and that if you will furnish the money you will become the savior of mankind. I only ask that you have faith in me, that you bear with me yet a little while. And I promise you that your reward will be great."

His earnest manner impressed me. He never made idle assertions, and I was convinced that he had discovered something that was going to astonish and benefit the world. As he talked on and elaborated, yet guarded the secret of his scheme, I listened sympathetically, and at the end of two hours I surrendered and agreed to let him have the money—inwardly calling myself an ass for doing so.

"I will go back to New York with you," I said, finally, "and complete all arrangements. Of course the first thing to build is a hangar."

"I've already leased that of Atlantic Air Lines, Inc."

"You've already leased it!" I exclaimed. Inwardly, however, I secretly admired his cock-sureness.

"To be sure, Zane I knew you would come across."

I laughed and held out my hand.

"You are the only man in the world that could put this over on me, Halpin," I said sincerely.

"And I have my engineers picked and sworn to secrecy," he went on with sparkling eyes. "Secrecy and speed must be our two great allies from now on until we are ready to take the air. Perhaps we can still save those madmen, Zane," he added reflectively.

It took him but a few days to get things going nicely, after which I went back to my Adirondack estate to impatiently await further developments. They came suddenly and unexpectedly.

## The Fire-ball

I WAS sitting in my living room languidly watching the television screen and listening to the mixed offerings of the radio, when the screen, which I had set revolving in the hope of picking up something of interest, showed a white light in the sky above the Atlantic. It glowed now and then with a pinkish tint, faded away, then pulsed back into life, wavered, and finally turned to a bright red. In a moment this vibrating light was displaced by a great fire-ball, red, sizzling and awe-inspiring. It shot across the sky with awful speed, then exploded with a deafening crash, whose detonations and rumbling echoes came distinctly over the radio. And then the whole heavens were filled with shooting, blazing stars which threw off trains of flaming sparks, until it seemed that the universe was being consumed in a blast of fire. In amazement I stared until the last spark went out in the gloom of the horizon. At that instant on the sea below I saw the passenger liner, *Conqueror*, as her radio announcer began an excited description of the phenomenon. From his description, it seemed that the great ball of fire had appeared out of the north with the suddenness of a thunder-clap, illuminating the sea for miles around with the glare of a noon-day sun. Apparently the meteor had completely disintegrated on striking the earth's atmosphere, and although the *Conqueror* was directly beneath, not so much as a fragment struck the ship or fell in the sea nearby. Only a thin, gray dust, settling slowly in the still air, gave evidence of a great celestial explosion.

I lay awake nearly the whole night wondering about this latest visitor from space. Meteors of major size had been rare since man began to chronicle the events of the sky; and generations had usually intervened between the advent of such huge bodies. But here was the second meteor to eclipse in size all previous ones, coming to the earth's atmosphere within a period of six months! And, most remarkable of all, both had been completely destroyed on contact with our cushion of air. I began to believe that Doctor Halpin was right—Dame Nature's meteoric curtain surrounding our globe would prevent any space flyer from reaching outer space. For if there were in that curtain missiles as high as a modern sky-scraper and as long as a city block, what chance had a thin-walled space flyer to overcome their onslaughts? Was the meteor belt increasing in activity? I wondered. Would it continue to gather material from the exhaustless realms of space, to expand, increase and solidify until it would hang a huge pall between us and the sun, throwing the world into darkness until at last it would crash down upon us—a veritable deluge of ruin and death?

THIS appalling thought was still with me the next morning as I sat down to breakfast. But before I had taken a single mouthful I was still further shocked and mystified by the hoarse voice of the radio announcer. From far off China came the word that the largest meteor ever seen in that section had suddenly appeared and burst above the northern plains. Everybody was terrified and thought the end of the world at hand. Added to the terror and mystery of the thing was the fact that not a particle of the sky wanderer had reached the earth

"Two of them less than twelve hours apart!" I exclaimed to Tom, my colored butler. "What in the world are we coming to?

Tom opened his mouth to reply, but ended in a gasp. London was announcing in high-pitched accents of excitement that the British Isles and in fact the whole of northern Europe had just witnessed a duplicate of the fiery phenomenon that had just startled all Asia. But the meteor over England had come nearer the earth before burning up than her sisters of the skies. The whole countryside had been showered with dense clouds of ashes and black specks like sifted cinders, which scientists were now gathering and attempting to analyze.

Tom's black face was positively ashen as he stared at me in speechless amazement.

"They are getting thicker, Tom," I said at last.

"Indeed they is, boss," Tom began. But I stopped him with a gesture, for my name was being called on the automatic telephone.

"You there, Zane?" came Halpin's familiar voice. "Ah, yes, I see you now," he added. "Well, what do you think of those last sky babies? Bully, eh? How about my theory now, my boy? I reckon we'll make some of those old moss-backs see the light before we get through with 'em."

"Perhaps," I replied wearily. "But say, where in thunder are all these meteors coming from? It seems to me that if they keep on they are going to overwhelm the earth."

"Ha, ha," laughed Halpin and the television showed his face wrinkled with mirth. "How are they going to overwhelm us when they can't get through the atmosphere. Let 'em come—the more the merrier." And he laughed again as if it were all

a good joke.

I was amazed at his words and manner. These great manifestations of nature's forces, which were amazing and terrifying the whole world he was treating in a spirit of levity. How did he know but what sooner or later one of those gigantic fireballs would break through the atmosphere, land in the midst of one of our large cities and destroy thousands of lives? Of course he did not know, neither could he prevent such a dire calamity.

"You take the matter very coolly, Halpin," I said.

"Why not?" he shot back with another burst of laughter. "There's nothing to worry about, my boy, and it wouldn't do any good, even if there was. Probably Professor Hime of Harvard Observatory is right—these large meteors are but left-overs from that erratic swarm of Leonids which have been under observation for more than a thousand years, but which have, in part, been attracted by the earth. You know that those that still keep their old orbit are due here about now."

"Yes, I know. But isn't it an astounding fact that despite their great size not a piece of them has reached the earth?"

"Well, we shouldn't worry about that," answered Halpin with a peculiar chuckle. "Nature has armored this old globe pretty well, Zane."

"Yes, and if your theory is correct, your new space flyer is doomed."

"Wait and see, my boy," he challenged good-naturedly. "Just wait and see! Now I must get back into the harness," he added in graver tones. "Everything is coming along fine. Still we must make haste, Zane. We've no time to lose. I think we may look for more giant meteors soon."

As the screen went dark, I turned back to my breakfast in a maze of wonderment and perplexity. So Halpin predicted the early arrival of another super-meteor! On what grounds did he base his prediction? There was a veiled, mysterious meaning in his words and actions. Why had he mentioned the need of haste? Still I believed him, for he understood meteors better than any other man in the world.

Soon the air was humming with the words of the world's mightiest savants, as well as the opinions of statesmen and inventors, business men and farmers, laborers and tramps. All had an explanation, and all had a prophecy to offer. But the words of Professor Loyal of Mt. Wilson seemed the most plausible and carried the greatest weight. He held with Professor Hime of Harvard, and other astronomers, that these giant meteors were just stray members of the great swarm of Leonids which the gravitational pull of Jupiter had held captive for more than a generation, preventing their regular visit near the earth's orbit. He prophesied that we might reasonably expect a visitation from the whole swarm within a few years, but added that there was no cause for alarm.

## CHAPTER III

### A Seeker After Immortality

THE winter wore on and no more celestial wonders blazed across the sky, and the people of the world began to lose their fears. Furthermore, it was pointed out by astronomers that the giant meteors that had startled the world were largely gaseous despite their appearance of solidity, and this would account for their complete disintegration on striking the air. Such an hypothesis seemed perfectly reasonable to me, but I'll never forget how Halpin laughed when I explained the idea on a visit to him. As I considered his mirth ill-advised and he still persistently refused to enlighten me on the secret of his space flyer, I bade him a rather cool goodbye, climbed in my plane and took off for home, though he earnestly besought me to spend the night with him.

It was two hours after dark when I arrived home. There was no moon, but the night was calm and the clear sky spangled with stars. And although it was nearing springtime the air was just crisp enough to be exhilarating. About two inches of snow carpeted the ground, and on its white bosom tree and shrub and buildings loomed mysterious and beautiful in the soft light.

I housed my plane, and then feeling a bit out of sorts over Halpin's inexplicable attitude, I determined to roam about the grounds for a while, to walk off my grouch. And this odd notion of mine is really responsible for this story.

This time it came out of the west, a sudden, blinding flash far up in the sky, paling the stars and filling the heavens with an incandescent glow which reflected back from the snow-covered ground with almost noon-time light. And then, as it left a spark-strewn trail across the sky, I saw the cause: another monster meteor, far larger than its predecessors, was plunging earthward. Although it must have been more than seventy-five miles above the earth, its size was so great, its light so overpowering that for the time being I froze in my tracks overcome with terror and amazement. And then as I gazed in awe it seemed to pause an instant directly overhead. Only for a moment, however, then with crashing peals of thunder that made the very air about me pulse and tremble, it broke apart, scattered all over the sky in huge chunks of fire which, with deafening detonations, trailed away in all directions and lost themselves among the stars.

For a long time I stood like a statue staring up at the sky after the last vestige of the meteor's eerie light had gone out above the horizon. Now, as I stared, the same sort of ashes that Halpin and I had seen that July night began to fall around me. But they were heavier, thicker, filling the air with dense clouds, and once in a while I heard the impact in the soft snow of some heavier substance, like small pebbles and the slither of coarse sand. Then I heard distinctly the thud of something striking among the bushes on the hillside.

Startled but athrill that at last we were to obtain some tangible specimen of the giant meteors, I went up the hill on the run, for the crash that I had heard must have been caused by a good-sized rock. I looked eagerly ahead, expecting to see the snow steaming from the hot contact. I saw nothing of the kind, heard no sound save the crackle of the sticks and bushes under my feet. At last I stopped and looked around in wonder. The undergrowth was particularly heavy in that vicinity, and the spruce and the hemlock cast dark shadows. Save for the faint light reflected by the snow, I stood in darkness. But darting my flashlight here and there, I began a careful search for the rock. I knew that science would be very glad to get this specimen of the meteoric world which had fallen near me. But after tramping about for a half-hour I had found nothing.

### An Astounding Discovery

I WAS on the point of giving up the search until daylight when I was startled by hearing a faint moan back of me. The sound came from a thick clump of hemlock. Thinking that some poaching hunter had met with an accident, I penetrated the thicket, parting the bushes and throwing the beams of my flashlight about. Then with a gasp of dismay and astonishment I saw the source. There in the bright rays of my light lay a twitching figure encased in a strange metallic suit resembling a medieval knight in armor! I stared and stared, unable to believe my senses, as the figure moved ever so slightly on the soft snow.

Was I dreaming! Had the constant recurrence of these meteors as well as Halpin's strange warning affected my mind? The weirdness of the spectacle held me rooted to the spot, incapable of moving.

After the first stupefaction had passed, I noticed that the creature tried to lift its hand to the metallic globe that probably represented the head. Going to it I noticed a pair of screws, one on either side of the head piece. Turning them I saw that I could loosen the headpiece after a little labor, and

with a deft movement pulled it away from the rest of the armor. At once the creature's head was exposed; and then came the greatest shock.

It was a woman! A beautiful woman with hair that was the gold of the sunset and a skin of the most miraculous whiteness and softness! Her eyes were closed. Her face had an extraordinary pallor. Perceiving at once that other screws were on the sides of this metallic suit, I proceeded to work on them to release this beauitful vision from her prison.

Here indeed was a mystery, I thought as I worked at the screws. Where had she come from? What was the aura of strangeness about her that failed to give me any clew as to her nationality? Or was I really dreaming, perhaps the usual dream of the bachelor of forty? Would I awaken in my bed to laugh at myself for the strange feelings that assailed me at the sight of this beautiful creature?

Finally, with hands almost numbed from the cold, I had the suit loosened so that I could open it up and move it away from the stranger. When she lay revealed before me clad in a strange silky costume, I realized at once that I was possessed of a mad love for her. Her form was full and rounded; her skin was of that soft pink found on the inner petals of the rose, and her features I saw now were of the utmost delicacy. Never have I seen elsewhere such a perfect form. Her full, round bosom under her costume was rising and falling slowly, but her eyes were closed and I saw that she was unconscious. About her hips was wound a shimmering silver, metal cloth, and in the center of her abundant hair sparkled a great red jewel.

Even as more questions crowded on my astonished mind, I was aware that no such woman had ever been seen on earth before. Then near her head on the snow I saw a strange device, a contraption of little metal disks and wheels beneath which were two hand-holds. To these I judged she had clung. And then, suddenly, in a flash of revelation the truth blazed across my mind. This girl had come from another world! She had dropped from the meteor! Then, merciful God! *It could not have been a meteor that had exploded up there in the sky and cast her down to me!* And if it was not a meteor, the others also that had lately exploded in the earth's atmosphere, alarming all nations, were not meteors! If not, what in heaven's name were they?

I trembled, as the startling thought surged through my brain—none of these massive fire-balls had been meteors! They were great space flyers from another world, and for some reason they had come to our earth. But all had met disaster in the great meteor train surrounding the earth. Then Halpin was right. No space flyer could live through that charging, swirling, pulsing curtain of death. And yet, I reflected, he was going to try. For the hundredth time I wondered what he had picked up that memorable night of the Fourth.

But these thoughts were thrust into the background in contemplation of this girl. By some miracle she had escaped the explosion, had settled to earth by some strange means of such a nature that she still lived, though stunned and unconscious. But I could not stand here meditating. The girl needed attention. I gathered her up in my arms as though she had been a babe and carefully made my way through the bushes. As I went on I gazed down at her with mingled feelings of awe, ecstasy and alarm. When I reached the somewhat open ground I increased my pace to a run, for the snow had chilled her and her flesh was icy cold.

## She Recovers

I FINALLY reached the house, breathing hard from my exertion and hoping ardently that no one had observed me. Yet I knew that I must have help. This beautiful creature must be resuscitated and nursed back to health. Cautiously I entered the living-room and looked around. I keep few servants, and fortunately no one was in sight. So I bounded for the stairway and ran up with my burden and placed her on a bed. Then I thought of my old butler, Tom. I could trust him. Already I had formed the crazy notion of keeping my remarkable discovery from the world. I would conceal and shield this lovely girl. I would keep her presence on earth a secret—even from Halpin. I would pay him in kind. Besides, was she not mine? She had come to me from a far-off world to fill my lonely life.

I rang for Tom and set feverishly to work chafing her arms and legs. Just as I heard Tom stumbling up the stairs, her eyelids showed a faint tremor. Then she opened her eyes in a wide stare of terror. Such eyes! Blue and frank, and shining like stars beneath her beautiful brow.

She sat up and tried to get out of the bed, but I gently pushed her back. For a few moments she shrank from me, as though I was some loathsome monster ready to devour her. I made an awkward sign of friendship, and just as Tom came in she smiled faintly.

"For the Lord's sake, boss—" Tom began. But I turned to him, a finger on my lips.

"Strange things often happen in this world of ours, Tom," I said in a low voice. Then I continued, as his eyes rolled in fear and wonder. "I want you to understand that this lady's presence is not to be revealed to a living soul. You are to wait upon her, guard her from every danger and take your orders from me until such time as she is able to understand our tongue and communicate with us. Do you understand me, Tom?"

The old negro's eyes, still rolling and blinking, roved alternately between me and the girl. He was badly frightened, for as no women save a few servants were ever seen in my home it was clear that he believed I had lost my senses. Surely the sudden coming of this strangely clad beauty into my bachelor home was enough to make him think I had gone crazy.

"I reckon I does, boss," he managed to say at last in a hoarse whisper.

"Warm some blankets and bring them here, quick!" I ordered.

As Tom ambled away I turned again to the girl. She was regarding me with wide, curious eyes which had lost their shadow of fear.

"Do you feel better?" I asked awkwardly, even as I realized she would not understand.

And then she spoke. She addressed me in a voice of silvery beauty and mellowness, though her words were unintelligible. I shook my head, and she smiled understandingly.

We wrapped her in the warm woolen blankets and gave her a hot brandy sling. In a little while I was gratified to see her stop shivering. Then she smiled at me again and dropped peacefully to sleep. I marveled. What manner of woman was this who, a stranger in a strange world, perhaps in the home of an enemy, had yet the courage and the will power to compose herself to sleep!

ALL through the night I watched by her bedside, feasted my eyes on her beauty, dreamed mad dreams of making this girl my bride. I tried to grasp the significance of her visit and the stupendous import for the people of earth. Whence had she come, and what was the message she had brought across the cold, dark void of space? Why were the space flyers from another planet trying to reach our world? Were they friends or foes?

Judged by this winsome girl they must be friends, for certainly none but people of the highest intelligence and goodness could propagate and foster such an adorable creature. Anyway, I realized that I must be patient. The answers to my burning questions were locked in the brain of this girl. It behooved me to find the key.

I will pass over the anxious days immediately following the coming of my charge. Suffice to say that within a week she had lost all fear of me and her surroundings. I began to try

to teach her. At first my task was very difficult, although she responded to my friendly overtures and tried strenuously to make me understand her language. We made little progress until I suddenly remembered that the science of numbers is universal. So, by holding up my fingers one after another, by indicating, naming and duplicating certain things about the room, we began slowly to understand each other. Anxious to learn the name of her home planet, I one day spread a large map of the solar system before her. At once with her finger she began to trace the orbits of the planets. I was delighted with her knowledge of astronomy. In a little while she stopped with her finger near Jupiter and drew a circle around it, meanwhile looking at me with a smile. I was amazed. She was from that far off world, from a Jovian satellite! My wonder increased.

Spring came and went and summer was at hand before we were able to carry on a labored conversation. But from that time on she learned with amazing rapidity. Then came a day when she suddenly froze my soul with horror. Haltingly and in a voice of sorrow she told me an astounding story. Briefly she related how the people of her home land, called by her, Ralé, a satellite of Jupiter, sought to war upon the earth, to subdue its inhabitants and take it for themselves.

"We seek your world because here we can live in comfort. We are forced to this step by the cooling of our own world, which has supported life by its internal fires. Our scientists have told us that this Earth is favorable for life. We would secure it for ourselves."

I stared incredulously. It was the most amazing thing of which I had ever heard.

"You amaze me, Omene," I said. She had given me her own name but thus far had steadfastly refused to give the names of her family. "Your people are much like the people of earth physically. But our scientists have always contended that the conditions of life on other planets were so different from ours as to produce an entirely different species of intelligent beings. Because your world was so remote from the sun, we were sure it had no life resembling ours."

## Omene's Story

"I CAN'T understand the logic of your scientists," she laughed with understanding. "Human life is the same wherever found, as all animal life and all marine life are the same. The universe is a perfect unit. The contention of your savants that nowhere in the universe can the exact conditions to evolve human life be found save on the earth is absurd. Ralé is far from the sun, so that it gets little of the sun's heat, but we have had to overcome many obstacles to our advancement and civilization. We have mastered them."

"But I fear your people seek in vain to conquer us," I said. "We will never relinquish our world."

"Yes, I understand," she said. Then she became strangely silent.

But gradually, as the days passed, I managed to get the details of her story.

To accomplish their purpose, the Ralians built giant space flyers and sent them forth with their best warriors. But always they were stopped and destroyed by the meteoric stream about the earth, *not by our atmosphere!* The first ship, whose destruction Halpin and I had witnessed, was caught in the stream and blown to pieces by reason of the gases and explosives it carried. Then three others were dispatched and all met the same fate.

"It was then that my father, Emperor of all Ralé, being angered over the loss of his space flyers and the death of Prince Jeptho, who commanded the first ship sent out, ordered an extra powerful flyer constructed. And when all was ready he, himself, took command."

Omene paused and looked at me trustingly. At last she was giving me some sidelights on her family.

"I went with him to cheer and comfort him on the long journey," she continued. We set out across the tremendous gulf separating Ralé from this world. Having been forewarned against the meteors, my father determined to avoid them, seek an opening in the stream, and attempt to blast his way through by means of the gas-bombs which we carried. Such an opening was found, and without dropping a bomb we attempted to drive through it. But far down in the terrible stream of plunging rock and iron, the gap suddenly began to close. The ship was pelted by an awful shower of missiles which set it on fire time after time. Our men in a frenzy of terror extinguished the flames in one spot only to find them breaking out in others. We realized that we, too, were doomed. We had no time to break through, either above or below, for the swirling, careening meteors were closing upon us rapidly. My father turned to me. Without speaking he told me to get into my space suit and placed a gravity nullifier in my hands. I understood what he would have me do—he would have me take the slim chance of jumping toward the earth. It was my only chance!

"I protested. 'I must remain by you and die by your side,' I said."

"'I must remain with the ship, my daughter,' he answered. 'But you must save your life, if this be possible. Go, reach the earth and live there!'"

"In vain I begged him to let me stay on the ship, but he would not listen. He seized me and kissed me passionately. Then opening a door in the bottom of the ship he forced me through the opening. As I dropped earthward I must have fainted, and I knew no more until I opened my eyes and saw you bending above me."

AS she finished speaking she gazed at me fearfully, and I was so overcome for a moment by the horror and the wonder of it all that I could only stare at her in return. She had escaped the meteors, then, only by a miracle! And her people were blood-thirsty, ready to annihilate the people of this innocent planet in a mad attempt to acquire for themselves a place to live in comfort. It all seemed incredible, with Omene so gentle, kind and womanly! For these attributes I loved her.

"Then your people would kill us," I said at last, "if we were not protected by the meteors."

"I am afraid so," she said sadly. "At least to the extent of colonizing the earth. To break a way through the curtain of meteors I know that they plan to send down explosives—perhaps more powerful than any known on earth—tons of them. I fear for your sake, my lord! Some of them are sure to break through, and if they do, many of your cities are doomed."

I stared, aghast with horror. It was a new problem for humanity—a problem pregnant with tragedy and despair. I could not believe that this fair creature had the blood of murderers in her veins. And I was loving her, shielding her, when I knew that I should not. Yet I made up my mind to shield her forever. For I feared that, should I reveal the nature of the giant meteors to the world's people and the presence of Omene, her life would be endangered.

"You fear for my sake, Omene?"

"Yes, my lord, for I love you."

I held her in my arms, her body against my own. I did not doubt the truth of her words. Yes, the terrible secret of my sweetheart I would keep forever. No one should know, none suspect that one of the inhabitants of Jupiter's satellite lived on earth.

Omene's room was large, lighted by great windows looking both north and south. Here within its confines she was kept. I taught her at once not to trespass beyond the doors of her chamber, and she obeyed willingly, for she feared to meet others of the world's people. Only Tom and I had access to that part of the house, so there was little danger of other servants' discovering her.

## CHAPTER IV

### Another Crash

THE days passed swiftly, and my time was so taken up with the care and the happiness of Omene that I lost contact with Halpin. Over the telephone he complained of my lack of interest in the new space flyer he was building, wanted to know what the blazes was the matter with me, and when I was coming down to look the ship over. I paid but little attention to him, for, now that Omene had made such startling disclosures, I had little faith in his space flyer. I figured that if the great space flyers of Ralé, whose civilization and science must be much higher than ours, were unable to force a way through the meteoric stream, nothing that Earth man could built would ever get through. Also, I was worried about other ships yet to come from Ralé, for Omene confidently asserted that they would assuredly come, and that sooner or later some of the explosives would plunge through the meteors and scar the earth with the hand of fire and death.

One day a voice over the radio made the momentous announcement that the successor of Professor Moltsi's ill-fated craft would take off at sunrise the following day. The ship had been built especially large and strong; its rocket motors could take it to the moon and return, and its backers fondly believed it would be able to weather the meteor swarm, for they still refused to credit Halpin's gloomy predictions. This news shocked and worried me, for I believed that it meant the tragic death of more brave men, and a bitter setback which would retard the progress of space flying for a generation.

It was the latter part of May, a day warm and sunny, with the earth decked in its new vestments of green and the myriad flowers of spring.

Despite the beautiful garb of nature, my love for Omene and the balmy weather, I was restless and filled with foreboding. I longed to warn these space travellers, to point out the danger they were facing, to tell them of the terrible and resistless power of the meteors which had so easily destroyed the giant cars from Jupiter. But I could not do so without betraying Omene, who was already becoming restless under restraint. That morning, gazing from the windows on the fresh, green earth, she had expressed a desire to go out-of-doors and roam about in the sunshine amid the glorious flowers and cool, green grass. I pondered the problem of taking her out, but I could not quite risk a decision.

For an hour I trudged over the estate, and as I neared the house on my return, I looked up at Omene's window. She was leaning against the closed window, a thing which I had expressly forbidden her to do—staring out over the sunlit gardens. As she saw me she waved her hand energetically. The sun fell full upon her fair form, glinted on her hair and blazed on the monster blood-red ruby in its center.

I was vexed that she was thus exposing herself, but was thankful that there were no servants near. I had repeatedly cautioned her to keep well back from the windows during daylight hours. So I went up to her room determined to scold her a little. But when I gazed into her limpid, soulful eyes my anger vanished.

"Take me out among the flowers, my lord," she begged. "As I look upon them from the window they remind me of that far off home of mine which I am never to see again."

HER voice was tremulous and my heart was touched; she sank into a chair wearily. Seating myself in front of her, I reached over and took her hands.

"I am lonesome and homesick, my lord," she said, "and I would—"

She stopped abruptly, her eyes staring in terror as she gazed past me toward the open doorway which was at my back.

I turned and stared in blank dismay, for there, with a broad smile on his face, his long, thin hands raised in mock astonishment, stood Halpin!

Damn his impudence! Of course he was accustomed to entering my home unexpectedly and unannounced—a privilege that no other man enjoyed. But now! I felt like smashing his face as he stood there, grinning, first at me, then at the girl. I thought I knew what he was thinking, and my blood boiled. He had discovered my secret, the secret of a professed bachelor!

"This is an unexpected pleasure," he said at last, with a low bow. "I saw the lady standing by the window but a few minutes ago. Zane, if I may be allowed," he added, "I crave the honor—" He paused and turned to me with a quizzical smile.

I swallowed my gorge, but my embarrassment was not lost on him.

"Omene, permit me to present my friend, Doctor Martin Halpin," I said as gallantly as possible. "Halpin, this is Omene from a satellite of Jupiter."

Halpin gave a slight start and his eyes widened a bit. That was as near being excited as he usually got. Then I saw that he was staring hard at the great ruby in Omene's hair.

"I reckon you've been putting something over on me, Zane, my boy," he said finally.

"Forgive me, Martin, but I think we're even."

He chuckled.

"May I ask when this young lady arrived?"

Briefly I informed him, while his eyes shone and he rubbed his lean hands together in delight.

"You don't seem to be surprised," I said. Which, after all was a lame remark for me, because nothing ever seemed to surprise him.

With a chuckle he thrust his hand into that capacious pocket of his long-tailed coat and fumbled a moment; then his hand came forth holding between thumb and finger the exact mate for the great ruby in Omene's hair!

### Intrigue

THE girl looked at it with staring eyes, then with a cry she sprang forward, snatched the jewel away and pressed it to her lips.

"Jeptho, Jeptho, my brother!" she exclaimed.

"Your brother?" said Halpin incredulously.

"Yes! He was lost with the first space flyer sent to earth."

Halpin nodded in understanding sympathy.

"This jewel, then," I said, turning to him, "is the—"

"Is the object I picked up out there last Fourth of July," he answered, with a grin. "It was still hot when I separated it from the ashes, and I knew it had come from the skies. As it was a cut stone, I also knew that it came from no meteor."

"It is a badge of rank in Ralé," explained Omene. "None but those of royal blood are allowed to wear it."

"Is it possible that the people of Ralé speak our tongue?" asked Halpin.

"No, my lord."

"Then I must compliment you, Zane, on teaching this young lady such excellent English in a few short weeks."

"Pray give the pupil the praise," I said as I heard some one lumbering up the stairs. A moment later Tom burst into the room.

"Come quick, boss," he panted. "Tony and Mike are fightin' again and I's afeared they'll kill each other."

Mumbling maledictions on my two Italian laborers, whose hot excitable blood was always getting them into a quarrel, I followed Tom from the room. It took but a few minutes to settle the quarrel, but those few minutes were fraught with tragedy for me.

When I got back to Omene's room I found Halpin holding her hands and leaning over her with his face close to her own

They were talking earnestly in whispers and he was gazing at her intently.

He dropped her hands as I entered, and the girl drew back blushing.

"Your—your—friend, Doctor Halpin," she stammered, "has kindly given me Jeptho's jewel."

I stared at her as a hot wave of jealousy swept through me. But I was ashamed of it, so shook it off and forced a smile.

"I'm delighted to hear it," I said, easily. "I'm sure you will cherish it."

"Martin, why didn't you enlighten the world concerning your suspicions last July?" I asked suddenly, to relieve the tension.

"No one would have believed me," he answered. "Instead of trying to convince an unbelieving world I prepared to repel these invaders." He turned to Omene. "Forgive me," he went on apologetically. "We don't wish to fight your people." She smiled graciously and he continued: "But now that we have tangible proof of the soundness of my theory in the person of this charming girl, I think it's our duty to make the facts known so that those damned idiots won't start out in their space flyer to-morrow to meet their death."

"We'll do nothing of the kind," I said sharply. "Omene is not to be subjected to the scorn and ridicule of the world. People wouldn't believe our story; they would simply pronounce her a fake. For if she were dressed in our style of clothing, she would pass for one of earth's lovely maidens."

HALPIN whistled softly and looked at me with a knowing twinkle in his eyes.

"Perhaps you are right, Zane," he said reflectively. "We'll guard our secret until we finish our space flyer, get above the curtain and demonstrate our power."

I thanked him. Then we left Omene and went down to the living room. Suddenly the mellow, pulsating tones of Professor Stone of Mt. Wilson were heard issuing from the radio.

"I wish to report," said the professor, "that we have just sighted several dark bodies moving swiftly across the heavens. They are doubtless meteors, and the world may soon expect another dazzling spectacle of these masses bursting in the sky."

"Humph!" grunted Halpin. "The world would get something more than an exhibition of fireworks if those fellows could get through!"

I said nothing. I did not want to mention at just this time the invaders' reasons for coming nor the explosives which they carried in enormous quantities in their huge space cars. That would have have caused him immediately to question Omene further, and already his interest in her was deucedly irritating. I have to confess with shame and bitter regret that, had I submerged my jealousy then and there, thousands of lives would probably have been saved.

Soon the astronomers at Yerkes and Harvard also reported the supposed meteors. As Omene had said, her people would keep up their attack, despite their repeated failures to break through.

Halpin stayed around all day, visiting Omene under the slightest pretext, but always in my company. I was genuinely alarmed as I listened to their talk—so much of it being personal—and saw by his warm glances that she had captured his heart. For the first time since starting his space flyer he seemed to be in no hurry to get back to New York. He explained naively that the work was progressing well and could be taken care of by his engineers. He needed a little rest, anyway. So he stayed with us that night, but before retiring he went to my radio broadcaster and issued a final plea to the navigators of the new space flyer to defer their flight until he could finish his own ship and make a study of the meteoric curtain at close range. From the reports we received, he was laughed at for his pains. His words of wisdom and warning were considered to be the wailings of a jealous fear that they would win the glory of being the first of mankind to reach the outer confines of space.

## A New Tragedy

THE next morning the new space flyer, manned by a crew of fifty men, left its hangar according to schedule and, amid the applause and well wishes of countless thousands, soared bravely into the sky.

The weather was fine, and immediately all the astronomical observatories east of the Mississippi turned their telescopes on the adventurer. Straight into the blue the great ship sped. And then, as we watched her through our own telescopes, word came from Harvard Observatory that one of the great, dark meteors had just been seen above New York, directly in the path of the on-rushing space flyer!

"The poor fellows are plunging to their destruction!" I gasped.

Halpin only shook his head sadly and compressed his thin lips.

Just what happened we were unable to see through our own small telescopes. We watched the ship until it dwindled to a mere speck and disappeared in the void. But the radio soon brought bad tidings. Harvard, which had kept the ship under constant observation, announced that it had gained the center of the meteoric swarm apparently unharmed. The ship's officers radioed that all was well; the armor of the ship had been able to withstand the almost constant pelting of small meteoroids. Then the messages suddenly ceased, and Harvard reported that the ship seemed to be in distress. She was wobbling badly, dipping and circling as though trying to dodge some attack from an enemy invisible to the watchers on earth. And then, directly above her, but outside the meteoric stream, suddenly appeared one of those large, dark meteors. With amazement, the astronomers watched its movements, for it gyrated and swung in narrow circles that were utterly unaccountable. Then, suddenly, fire was seen to spring from the top of the distressed space flyer, which, after pitching crazily for a moment, burst asunder amidships and plunged toward the earth. Intent on watching the falling ship, the astronomers lost sight of the meteor; and when, a few minutes later, their telescope once more swept the sky, it could not be found.

"Come on, Zane!" Halpin cried, turning from me like a flash. And before I could reply he was at the door, his long legs flying down the path toward the airplane hangar. The professor had calculated the probable landing spot of the falling wreck, and I knew what was in his mind. Hastily calling to Tom to watch over Omene, I raced after my eccentric friend.

Within an hour we found the wreck and landed near it. Although broken in two, the sections had fallen close together, and as the country was sparsely settled, we were among the first on the ground.

NOT a man of the brave crew was found alive. Their bodies were all seared and blackened as if from the effects of an explosive, and the severed, ragged ends of the space flyer, where it had been torn apart, confirmed this theory. Yet it was known that neither explosives nor inflammable gases were carried on the ship.

"I don't like the looks of this, Zane," Halpin said soberly. "The explosive that rent this great ship penetrated to the center of the meteoric stream. Suppose that it had gone clear through!"

"I'm afraid some such thing will happen some day," I said with a shudder.

However, even if the space flyer had not been shattered by an explosion, she must soon have fallen anyway, for her hull was riddled and pierced in hundreds of places, the holes being so large in spots as to appear like perforations made by giant shells.

"The poor fellows hadn't the ghost of a chance," said Halpin, shaking his head.

The interior of the ship had been completely wrecked by the awful fusillade of missiles that had crashed through the sides. Tons of meteorites—from the size of a pea to that of a bass drum—lay scattered over the decks and wedged tightly in the machinery they had demolished.

"How will your space flyer escape a like fate?" I asked Halpin as we went back to our plane. We had left the wreck to the speculations of the curious crowds that were gathering from over the land and from the air.

"Easy as pie," returned Halpin with a confident smile. "Our space flyer will ward off these meteor attacks with perfect ease. Wait until you go with me on a demonstration tour which we'll take within a fortnight. But, Zane," he added, earnestly, as we zoomed into the air, "I want first to go before a committee of government scientists and tell them frankly of the mighty problem we are facing. It won't be necessary to reveal Omene's presence among us," he went on, "if you think it best not to do so. But we can tell them the main facts so that the world may get ready to repel the invaders. Now, as you have influence with the powers that be, I look for you to arrange the meeting."

"I'll gladly do my best, Martin," I assured him.

## The Meeting

SO I arranged the matter, and a few days later we met the committee of scientific experts, which the government had long found absolutely necessarry for maintaining the welfare of the American people.

Halpin wasted no time in idle preliminaries but plunged at once into his subject. His sudden and astounding revelations at first filled his hearers with consternation and fear; but then uncertainty and doubt began to creep in, and they replied with scorn and open ridicule. The chairman of the committee pointed out the glaring fact that no communication between the earth and any other planet had ever been established. No proofs that other worlds were inhabited had been offered; indeed, it was the united opinion of the world's best minds that nowhere in the universe save on the earth was human life possible. For an erratic and discredited scientist like Halpin to declare that a Jovian satellite—far from the warming rays of the sun and known by all the rules of physics and biology to be unfit for human habitation—was sending space flyers to conquer the earth was ridiculous. And for him to maintain that the huge meteors which recently had visited our atmosphere were some of the flyers in question was too utterly preposterous to gain the attention of thinking men.

"When, at the earnest request of Mr. Zane Hardy, this meeting was called," said the chairman, "it was understood that Doctor Halpin had something new to offer us relative to a successful space flyer which we understand he now has under construction. We are of course intensely interested in such a proposition as that, but we are very busy men; and since the whole world is at present mourning the recent destruction of two super space flyers, we submit that it is neither patriotic nor fair to the memory of the brave men who died in them to ask us to waste our time listening to fairy tales."

"You had no temper to listen to so-called fairy tales when I warned you against the folly of sending your space flyers into the sky," retorted Halpin, warmly. "Because you would not listen to me, those brave men went to a vain and inglorious death. As for my own space flyer, you soon may witness a demonstration of what that mighty ship can do. I shall drive her through the curtain of meteors—the same curtain that is now checking the warriors of Jupiter's satellite. I urge that the government take immediate steps to build hundreds like her."

"We are ready to admit that your theory with regard to the density of the meteor stream may be right," said the chairman. "The terrific pummeling that the last space flyer received bears eloquent testimony to its correctness But we can not lose sight of the fact that the flyer that went to its destruction was built by the world's most eminent engineers, was constructed throughout of the strongest materials and armored as heavily as is feasible for such a craft. Yet it was pierced and riddled, even broken apart, by the impact of some giant meteor. How then can you hope to surpass the product of our greatest engineers?"

"I WILL do it because of my superior knowledge of the great envelope of air and matter surrounding our earth," said Halpin with quiet dignity. "I maintain that the outer shell of our atmosphere is hot instead of cold. Inside this shell is a stratum of air heavily charged with electricity, circulating constantly from west to east. Above this layer of air is the meteor stream. But this last ill-fated pace flyer was not torn apart by a meteor, though it was thought one was seen directly above it. It was blown apart by a bomb dropped from this so-called meteor, which was in reality a space flyer from a satellite of Jupiter which I call "Ralé!"

Many of those wise scientists smiled at this, while the chairman cleared his throat.

"It would be utter folly to ask our government to construct a fleet of space flyers to fight an imaginary foe," he said coldly. "And I—"

He paused staring, for Halpin had abruptly left the conference table and was striding toward the door. He had had his say, had been refused support, and this was his way of indicating that he had no more time to waste on unappreciative hearers. I was placed in an embarrassing position, for I had to apologize for him. I did this promptly, begging them to excuse his lack of courtesy and asking them to give serious consideration to his warning, for the soundness of which I vouched completely.

"Besides, I have a startling announcement to make," I went on, for I was peeved that they doubted our word and had turned Halpin down so coldly. "The reason that the space flyers of Ralé attack us is that they are on the most startling and remarkable mission ever undertaken by the people of a far off world. They want to take over our earth for themselves."

For a tense moment they stared at me in silent wonder: I saw that they deemed me crazy. Then a hot argument broke out. Many of the committee began to take my side, but the meeting soon came to a profitless end.

## The Brain Child

I LANDED at New York to take Halpin home, and although I was anxious to get back to Omene, I stopped to look over the space flyer. She was a peculiar looking craft, shaped like a cigar, except that both ends came to a sharp point. She was perfectly round and smooth and of a shiny silver color. In her rear and in front as well as along the sides projected the rocket tubes, while along the sides were the wings which could be withdrawn into the ship at will. There she rested on her cradle like a great silver-winged cocoon, and for the moment I could fancy a giant butterfly was breaking its shell and filling the hangar with its glory. But Halpin, noticing my puzzled stare as to where the doors were, soon found a hidden button; a panel slid to one side and we entered an air-lock. From this chamber a second door opened into the ship.

The *Space King*, as he proudly called the craft, had a cubic content less than half that of either Professor Moltsi's ship or the one built by the government. Her walls were surprisingly thin. They consisted of two sections of *drulin*—a hard, steel-like metal invented by Halpin and his engineers. This metal was about two inches in thickness, and the walls of the flyer consisted of two shells set about a foot apart and separated by a vacuum. The interior of the vessel was a network of wires and cables hung above all manner of dynamos, motors and transformers. Levers and dials of curious design were so numerous as to be positively bewildering

The rocket, electrically driven, used *bennite*,* as a fuel. I discovered that there were ports and lookouts and range-finders which were cleverly sheltered by the hull and apparently sealed in a smooth surface, but which could be uncovered whenever the ship sailed outside the meteoric swarm.

"When we enter the field of the meteors," explained Halpin, "our great electrical generating equipment is turned on and the entire length of the ship becomes encased in a thick wall of repulsion rays. Small meteors, striking this electric envelope, are turned harmlessly aside. Large bodies we can easily see and side-step."

"I hope she works," I said rather dubiously.

But after Halpin had shown me all over the marvelous craft and explained in detail his many wonderful devices and inventions, I began to have faith in the ship.

When I reached home, Omene met me with eager, questioning eyes.

"Will your people build space flyers to fight my people?" she asked.

I stared. This was the first intimation I had of her knowledge of our attempts at space flying.

"What do you mean, Omene?"

"Tell me, my lord," she said, "that your government absolutely refuses to consider Doctor Halpin's proposal."

"Omene, how do you know these things?" I asked in amazement.

She smiled sweetly.

"Something in your eyes tells me that the proposition was turned down. But soon you are to try out your own space flyer," she added. "I beg that you will allow me to accompany you on that journey."

SHE knew of that also, and I was sorely vexed. I saw that Halpin, usually so taciturn in the presence of women, had completely unbosomed himself to this girl. She had conquered him.

"I don't think it would be wise, Omene. The government will have its representatives aboard, and then there's the crew. You see I want to save you from embarrassment."

"But I *must* go with you!" she said. "I implore you to take me—I want to go home! Doctor Halpin tells me that this space flyer of his will be capable of making a trip to Ralé. And—and—"

"To Ralé!" I cried in alarm. "Why, my dear, that is impossible! This is to be only a test flight. And it would take many weeks to reach Jupiter. Besides, your people are at war with us."

"Don't call it war," she reproved. "It is not a sin to crave a place to live. And if I were to return to them and explain matters, their attacks would cease and your world and mine might sign a treaty whereby they could settle here peacefully."

She came close to me, threw her arms about me and gazed at me with pleading, amorous eyes. I kept my poise with difficulty. Only my indignation over Halpin's actions and my fear that I was losing her love kept me from yielding to her entreaty. I wondered what in thunder he meant by making her such rash promises. He seemed to be determined to disregard my wishes and reveal her to the world. Yet down in my heart I knew that that was the only proper thing to do. But my intense love for her would not permit it. Halpin had no right to make such promises, to assume such grave responsibility. She was mine, she had come to me out of the heavens, and I vowed once more that I would keep her always. Why expose her to the curious, staring eyes of the rough crew of the flyer, not to mention the prying orbs of the newspaper men and the statesmen and high officials of both army and navy who would be aboard?

"You can not accompany us, Omene," I said decisively. "It is impossible."

Gently, slowly, she removed her arms, stepped back a pace and regarded me reproachfully. Then she turned, went to a window and gazed up yearningly at the blue sky. I knew her heart was anchored in that far off world, and I longed to take her there that she might be happy once more with her loved ones.

## CHAPTER V

## The Trial Flight

OUR space flyer was scheduled to take off at nine the next morning. So at eight after a hasty breakfast, I bounded up the stairs to bid Omene good-bye. She was not in her room! I stared about and softly called her name. No answer. Then I hurried here and there among adjacent rooms, looked in closets and wardrobes, believing that in her disappointment she had hidden from me in a fit of despair. But she was nowhere to be found. In my alarm I called Tom. But after a search of a quarter of an hour we gave up and stared at each other helplessly.

"Done gone at last," exclaimed Tom in accents of awe.

"It seems so, Tom," I acknowledged huskily. "But you must keep on looking—alone, mind you. Don't let any one else find her! Now I must go. I can't keep them waiting."

"I'll do my best, boss," Tom promised as I hurried away.

It wrung my heart to leave home under such circumstances, but I knew Halpin would not wait a minute—even for me—and I was confident that Tom would soon find Omene and conduct her back to her room.

At my orders, my plane had been run from its hangar and made ready. I switched on the electric motors, which began purring softly. With the propellers idling, I entered the cabin and took hold of the controls. As I settled myself comfortably in my seat and was about to throw the ascending lever into gear some odd notion caused me to look rearward. I stared. For beneath the leather fringe of the lounge I saw a bit of pink flesh no larger than a half dollar. In a flash I was back there lifting the valance of the lounge, and saw, crouching there, in fear and trembling, my beautiful Omene!

As carefully as possible I took her by an arm and pulled her out.

"What do you mean, dear, by secreting yourself on this plane?" I asked, as she slowly regained her feet. "Never before have you sought to disobey my wish!"

With flashing eyes and haughty mien she drew herself erect, her lip curling scornfully. Then, giving me a withering look of reproach and hate, she turned without a word, sprang from the cabin and started for the house. Hoping that none of the servants would see her, I ran after her, imploring her to forgive me, to consider her own welfare and promising to try to take her home sometime should our trial trip prove successful. But she swept proudly on before me without deigning a reply or a backward look. At the door of her room she paused and, turning swiftly, cast on me a look of mingled scorn and hate that I hope never to see in human eyes again.

As I paused abashed at her manner, she slammed the door in my face, just as the faithful Tom shuffled up.

"Watch her, Tom," I commanded hoarsely, as his eyes rolled in wonder. "And for God's sake keep her from being seen by the other servants."

Once in the air I gave the motors the gun with a vengeance. I was late and I was—reckless. Mentally I cursed Halpin for his stupid meddling, for I was convinced that he had put Omene up to the trick she had attempted to pull off on me. She had melted his heart and he figured that, once on the ground with me, I would relent and allow her to accompany us. But for the fact that I felt I owed the service to my fellowmen, I would not have left Omene at this time.

* Invented by Tooke in 1991. A compound resembling dynamite but possessed of the quality of exploding in progressive stages. The power developed was immense.

NEVER before had I cut the air so furiously, wielded my controls with such frenzied madness, held such a bitter outlook on life. Halpin had betrayed my confidence, he had stolen Omene's love, and I resolved that if we lived through the trial flight I would sever the ties of our friendship. Even now I had wild notions of turning back and then by radio telling him and his space flyer to go to hell. But cooler judgment finally prevailed. I coaxed every atom of speed from my trembling craft and raced on. The earth slipped beneath me in a swirl of changing color. The wind hummed, shrieked and howled outside the cabin, as the plane strained and groaned with its exertions. With all this speed and recklessness I was nearly too late, for even as I landed near the flyer's hangar and sprang from the cabin, the sharp prow of the *Space King* shot from the wide-open doors and came near knocking me flat. But as I stepped back, the glistening walls of the ship barely grazing my head, a door slid to one side, two long arms reached forth and I was yanked aboard.

"Good morning, Zane," greeted Halpin, grinning into my face. "You're just in time."

I glared at him, but his very good nature, nerve and coolness beat down my resentment.

"I—I was delayed," I stammered as I wondered why he didn't ask me about Omene. "How is everything?" I managed to add.

"Fine!" he answered rubbing his hands together. "Everything is working beautifully. We'll soon be free," he went on with shining eyes. "We'll soon be sailing through space where no mortal earthman has ever been before. Come, let's watch our progress."

So saying, he led the way to the control room of the ship where the other members of our party were assembled, watching intently the great instrument panel. Here was a representative gathering of newspaper men, scientists, statesmen and officers of the army and the navy. . . . The conversation was fragmentary and subdued, the face of every man set and grave as though each realized that this great shining body might easily become the funeral car of us all.

Through the magnifiers in the bottom of the ship I saw the earth drop rapidly away. Even as I gazed in wonder, land and sea merged in one great purple blur. I realized that we were rising at a sharp angle, shooting into the sky with the speed of a meteor. Yet we felt no great sense of motion and little vibration.

"Look through here," Halpin invited, motioning toward what appeared to be the eyepieces of giant binoculars. At first I could see nothing but a deep, blue haze, but in a moment specks appeared before my vision, grew more numerous and larger as we rushed on, and I turned to Halpin inquiringly.

## Above the Stream

"WHAT is it?" I asked. "I see swarms of dark particles passing before the glass."

"Just a few meteors," he answered complacently. "We'll pass close to many of those babies before we get back."

"Pass them!" I gasped. "But suppose we should run into one!"

"We won't," he said confidently. "Our locators here show all such bodies within a radius of ten miles and enable us to side-step them automatically—even when flying blind. As to the meteoroids and smaller missiles which will shower upon us, our electric repulsion envelope will shoot them off from our sides like water from a duck's back."

Halpin glanced at the clock overhead. It was just 9:03. "In two minutes we shall be in the edge of the meteor stream," he continued, "and in another minute we shall be through."

"If we ever get through," I said, dubiously, as I turned again to the eye-pieces. "My God, I see them now!" I cried. "We are almost upon them!"

We were leaving the earth's atmosphere. The sky had changed swiftly from blue to black, as the night had suddenly come.

The star-studded sky was suddenly filled with countless thousands of hurtling bodies, rushing and charging like driven snow flakes in the lap of a gale. Only these fragments from outer space were dark and sinister in hue, and they were rushing on in such vast numbers as to appear like a great, irresistible deluge flung across the sky. Here and there appeared larger bodies, many the size of a city block, and I shuddered as I thought of the consequences should we strike one. I shrank back involuntarily as they hurtled past, for it seemed that I could almost reach out and touch them with my bare hand. Every moment, I felt, would be our last.

Finally Halpin pushed me gently aside, glued his eyes to the binoculars for a moment, then sprang back, ran to the controls and began to turn wheels and pull levers rapidly.

"Now the current is turned on fully," he announced, "and is stepped up to the terrible power of more than five million volts."

A thunderous humming now reached us from without; it was like the drone of millions of bees, but the ship sped on without a tremor, so perfectly were the gyroscopic stabilizers working. The very air was tense with suppressed excitement as we stared at one another.

"We are now in the center of it," Halpin announced presently in a low, calm voice, his eyes on a small glass which gave him a view of the outside. "We have just dodged two giant meteors either one of which would have crushed us. The smaller ones are sliding away from us harmlessly. To the watchers on earth the *Space King* now appears as a long, slender shell of fire, from whose sides the blue lightning is leaping and curling around giant sparks and fire-balls, which stream away from us in a golden shower. All ports and openings in the *Space King*—even the long tunnels of the screws—are now closed, only this guide into which I am looking being exposed. As it is very small the light entering it is caught by amplifiers. We are practically flying blind for a few moments, but we need have no fear on that score. As the meteor stream is but a few miles in thickness we shall soon be above it. We are traveling now only by the momentum gained before we struck the stream. And now we are through!" he suddenly added exultantly.

WE all stared speechless! Were we really through, I wondered! The dreadful humming had ceased, anyway, and I breathed easier.

Again Halpin motioned me to the eyepieces. The sky now was a cold black, the sunlight dazzlingly brilliant, and far below I could see the meteor stream rushing on around the earth. Suddenly in the field of my vision appeared a large, dark body moving swiftly across our bows. I stared in terror, for I recognized it—one of the space flyers of Ralé Then out of the black void came another one bearing down upon us. With a gasp I drew back and beckoned Halpin to my side.

"For God's sake, look!" I whispered. "We're doomed!"

Halpin's calm expression of confidence did not change a hair as he took my place. After gazing a moment he straightened up with a chuckle.

"We've nothing to fear from that fellow," he said easily. "You don't know our speed, my boy. Why, coming up here I had not even begun to let the old girl out. We could run away from him, but we don't want to. Now if you'll say the word, Zane," he added, "I'll make that chap squirm right here before your eyes, unless—"

"Unless what?" I said, as he hesitated.

"Unless some of Omene's people might happen to be aboard," he said gravely, as he gave me a searching stare. Oh, how I longed for the time to come when I could get him alone and rake him over the coals! "Gentlemen, come and see the space flyers of Ralé," he continued, turning to our guests. "And how

I wish I knew how the things are propelled," he added wistfully. "I can't see a single gadget that might explain it."

Admiral Moller, who always went around with a show-me air of doubt, was the first to look.

"Humph!" he grunted presently. "Another of those damn big meteors. But it's acting mighty queer for a meteor," he added. "And why in thunder isn't it down there with the others?" He turned to us with a puzzled stare.

One after another the others looked, then stepped back muttering words of amazement and wonder.

AGAIN I looked and was glad to note that both space flyers were receding from us rapidly. It was evident that they were frightened and mystified by our sudden appearance above the meteor train and had no intention of giving us battle.

"Those must be asteroids," said Colonel Spaulding of the Army. "We may congratulate ourselves that they are moving away from us."

Halpin frowned. It was plain to him and me that the others of our party refused to recognize the true nature of these monster visitors from another world. And, indeed, there was nothing about their appearance to indicate that they were space flyers or terrible engines of battle bent on the earth's conquest. Shaped like giant eggs, dark and solemn of aspect, with no visible ports, or means of propulsion, they appeared indeed like large meteors from outer space.

Far above the last thin envelope of air, which our instruments showed to be quite warm—thus bearing out another one of Halpin's theories—we rose into the absolute cold of space. And soon we ran onto another stream of meteors charging down toward the earth where it joined the curtain of its fellows. From out of the limitless black void we could see them coming—an endless, careening stream of matter adding to that forever whirling about our globe.

After sailing along in empty space for an hour or so we shot down through the meteor stream into the atmosphere, and in a few minutes were safely back on the earth.

Amid the acclaim of thousands, we carefully examined the hull of the ship and found that she had weathered the terrible bombardment of the meteors without a scratch.

The demonstration was a huge success: everybody conceded that, ungrudgingly. The press of all nations carried the gratifying news that at last a successful space flyer had been built. In the space of a few hours, Halpin had risen above the mists of obscurity into the dazzling light of international fame. From an unknown inventor of small household articles he had emerged from his seclusion to become a world hero. But although on the crest of this high wave of popularity, he nevertheless maintained a perfect poise, giving all the credit to his subordinates and shying at personal publicity. That made me admire him the more.

Despite his great triumph, however, the scientists and the government officials whom we had carried beyond our atmosphere, while warmly commending the great ship and its odd inventor, still firmly refused to credit his story relative to the people of Ralé, their quest after a share of the earth's comfort, and the nearness to our world of their terrible space flyers. They had seen these so-called flyers at close hand and pronounced them nothing but meteors.

## CHAPTER VI

## Messengers of Death

ON the flood tide of his sudden popularity, Halpin now electrified the country by going before a committee of government representatives and urgently advising them to heed his story and induce the government to construct a fleet of space flyers modeled on the *Space King*. He even offered to surrender his patent rights to his country and give his time and labor without pay. The offer was unusual and magnanimous, and although I backed his proposal strenuously, ably seconded by many other far-seeing scientists and statesmen, our government refused to consider the proposition. The idea of a war with another world supposed to be cold and lifeless seemed absurd to our statesmen. So nothing was done. But although Halpin was cast down by this refusal, he continued to pound his thoughts home to the people through press and lecture platform, and gradually he began to break down opposition.

Soon astronomers throughout the world began to report the sighting of many of the great, dark meteors. Harvard reported three in one night. But there was one strange, puzzling fact, often remarked in the press and argued over everywhere: no more were seen to enter our atmosphere and burn themselves up in a plunge toward the earth.

"Those chaps have learned their lesson," was Halpin's dry comment. "Likely, they are bent on some other form of mischief now."

HALPIN'S words were tragically prophetic. A week later the downtown section of Chicago about the Loop and all along lower Michigan Avenue was suddenly rocked by a succession of terrific explosions, and acres of office skyscrapers were brought down in hopeless, twisted, smoking ruins. Thousands, trapped at their work without a moment's warning, were crushed to death in the titanic wreckage. Other countless thousands were caught in the streets and buried beneath the falling buildings.

At once the most terrible and heart-rending excitement prevailed. Those who had escaped with their lives rushed about wild-eyed and disheveled, frantically calling for loved ones and demanding to know the cause of the catastrophe. Soon police and firemen, reenforced by whole regiments of national guardsmen were on the scene. But they were powerless to control the mobs of half-crazed men and women and terrified children that they encountered at every turn. The explosions continued intermittently for more than three hours, and soon they were scattered all over the city and far into the surrounding country. No one could account for the calamity. No explosives were known to be stored in the stricken sections. The afternoon was clear, warm and calm; only a few fleecy clouds could be seen far to the east. Finally, however, a few scared people came forward with strange stories. They had observed small, dark bodies streaking down from the sky immediately before the explosions. But none had actually seen those aerial visitors strike, and further, everybody was so excited and terrified that little credence was given these tales.

As the sun set, crimsoning the western sky with blood, and the stars came blinking strangely and dim through the dust-laden air, many began to believe the end of all things was at hand. Every now and then an awful roar would sound and a perfect volcano of fire and smoke would spout into the sky. It was then that hundreds fell on their knees and poured forth agonized prayers for deliverance from the awful scourge. But the braver among them soon recovered a measure of composure and set about the rescue of the wounded and burial of the dead. As the night wore on the havoc ceased. A deadly calm settled over the ruined city, which was in darkness save for the bobbing lanterns as the searching parties went about their work of mercy. The electric lighting systems had been put out of commission long before. The whole city lay crushed and bleeding as though it had been swept by some gigantic, avenging hand, which, having rendered the chastisement, had for a time withdrawn to await the effect on its victim.

Of course the whole world responded quickly to Chicago's cry for help, while scientists everywhere tried to account for the disaster. The press of the world teemed with explanations and conjectures, but only three people on earth knew the cause. As Omene had feared—her people, insanely pounding away at the meteor stream, had driven their explosives through the

curtain and reached the great city by the lake.

"It is as I feared it would be," she said when I made her acquainted with the tragedy. "But I warned you, my lord."

"It is true, but there was nothing I could do."

"There was something," she said firmly. "You might have let me accompany you in the *Space King*. If I could have reached my people they would for my sake have desisted from their attempts to reach the earth in such a manner."

I STARED. Did she really mean that—were her words true? I felt that I could not give her up, and, besides, how was she to reach her people? Such a project as a trip to Ralé seemed hopeless. Her words alarmed and worried me, yet I was relieved to hear them, for it was the first time she had spoken to me since I sent her back to her room.

"It is possible for Doctor Halpin to take me home," she said at last as though divining my thoughts. "He has said so. Let us hasten before some other of your fair cities falls in ruins about the heads of its people."

I stared at her in hopeless dismay. Halpin would really try to take her home? Surely he must be crazy. Mad with his love for her, he would attempt the impossible! I resolved that I would prevent such a foolhardy thing. If I must, I would fight it out once and for all. He should not have his way with her, should not sacrifice her life and his own, together with the noble ship his genius had built. Without another word I left.

I was filled with fear and forebodings, I knew the truth of Omene's words. Harvard, as well as the other large observatories, soon reported sighting many more large meteors. I was well aware that the sailors on those dark, sinister ships would madly strive on, seeking to break a way through the meteor curtain to the earth: that any time now more of their hellish explosives might rain down upon us.

This time the attack came with terrible suddenness, and to Boston. The hour of the first stroke was just before midnight. The sky was overcast by dark, leaden clouds from which fell a gentle rain. Suddenly a blinding flash was seen above the capitol, which a moment later lay in ruins. Smoke and flame and blazing material filled the air, tons of brick and stone shot into the sky, then fell in a scattering shower over many surrounding blocks.

Soon the streets were full of excited, milling throngs. But even as they breathlessly asked one another for an explanation and shouted for help, other explosions of like nature began to take place in various parts of the city, which was now plunged into darkness owing to the severing of wire and cables.

All through the night the people struggled and prayed in the gloom and the rain, unable to succor one another or to understand what was wrong or even to suggest a remedy. The strong trampled upon the weak, and in their terror and frenzy became beasts.

It was the most terrible disaster that had ever befallen the Atlantic seaboard. Daylight—which many believed would never come again—revealed the full extent of the catastrophe. Thousands had been slain, thousands more rendered homeless. Fire broke out in several sections, adding its weight of terror to that already present. Half of the city lay in ruins whose dismal aspects were intensified by the gray skies and cold, drizzling rain.

The nation, stunned by this second major disaster, had no time even to take breath or recover its poise before lower Manhattan Island was rocked by a series of terrible detonations, especially severe on Wall Street and lower Broadway. Here the havoc wrought was beyond the power of words to describe. Great gaping holes were torn in the streets, giant buildings were blown to bits and scattered far and near as though they had been made of card board. The streets were piled high with debris of all descriptions. It was realized that some explosive far greater than any known to man was responsible for the awful carnage.

The echoes from the explosions that had wrecked New York had not died on the air when the radio from Philadelphia announced that the "City of Brotherly Love" also was a victim of the invisible scourge from the air, though but two explosions had occurred and the loss of life and property was not so appalling as that in the other cities. But the moral effect was just as great.

## Scattering Explosions

DURING the next few days, as the nation tried desperately to get a grip on itself, reports kept coming in from all over the land, telling of meteors and mysterious explosions. Nor were these confined to the cities or other populous districts. Some had taken place scores of miles from the nearest habitations of man. A few were reported from isolated sections of Europe, and a passenger liner outbound from Plymouth had suddenly seen a veritable mountain of water heave skyward about two miles off her port bow, burst into a thousand cataracts and deluge the ship with monster waves that nearly sent her to the bottom.

I was distracted. Omene persistently refused to talk to me. Whenever I essayed conversation with her, she responded either with a cold glance or a disdainful shrug of the shoulders. I wondered whether she were enjoying the spectacle of human destruction brought about by her people. I could not believe it, for prior to the trial trip of the *Space King* she had been gentleness itself. Now, however, she refused to talk except to Tom and Halpin. She spent most of her time at the radio, an extension of which I had constructed for her entertainment. When Halpin saw it, he was immensely gratified, and soon afterward on one of his many visits he brought her a curious contrivance—one of his own inventions—which he explained would greatly increase and clarify the receiving power of her set. I did not test out the truth of this, for now I was embittered and angered by his influence over her, an influence that I still lacked the courage to break. I seldom visited her room and had practically ceased to speak to her.

Unable longer to endure her cold and silent reproaches, and beside myself with anxiety over the reports of other explosions—now coming in almost hourly by radio—I climbed into my plane and set out to consult Halpin. But he had little to offer that might ease my troubles. He wanted to talk almost constantly about Omene—how was she—was she thoroughly enjoying her radio—and what did she think of the awful explosions? In fact, he almost seemed to be enjoying the dreadful news drifting in from every quarter of the globe. He rubbed his thin, long hands together and looked at me with a knowing smile.

"I reckon by this time those wise ones don't think old Doctor Halpin is such a damn fool, after all, eh, my boy?" he said easily.

"Of course they don't. But, Martin, the people of Ralé are breaking through the curtain at last—breaking through when and where they please. And soon there won't be a soul left alive on earth."

"They are not breaking through where and when they please," he said, positively.

"But they are destroying our cities," I reminded him, desperately. "They pick out the most densely populated sections for their—"

"Hold on," he interposed. "You're excited now, my boy. The fact that most of their hellish bombs have fallen in our great cities is but a coincidence. They are constantly pummeling the curtain with hundreds of bombs. It so happened that a break in the curtain above Chicago allowed a large number to devastate that city. The same is true of Boston, New York and Philadelphia, as well as other sections. To prove that they have no particular aim other than to get a passage cleared to the earth, I have only to cite the fact that many explosives have fallen on the barren spots of earth—even on prairies and

among mountain fastnesses many leagues from a human being. Others have fallen in rivers and lakes and in the oceans themselves."

I had to admit the logic of his reasoning, but his imperturbable smile exasperated me.

## A New Disaster

"BUT what are we going to do?" I demanded. "We are powerless to stop this awful carnage and destruction."

"We are not powerless, my dear Zane," he corrected mildly. "Two procedures are open to us. If Omene were to be taken home, she could stop this mad attack of her people. She could tell them of the utter futility of their plan to acquire the earth forcibly. She could expose and explain the wild notion. Now, if by any means they know that she is held on earth, they may be angered that we force her to remain against her will." He paused, eyeing me quizzically, and I glared in return.

"Nonsense—damn nonsense!" I exploded. "I understand what you would say, for in a roundabout way through Tom I have learned of your insane scheme to take her back to Ralé. But I would thank you, Martin, if you value my friendship, not to fill her head with any more rot like that. I would have you let her alone, for she is mine. She came to me from the skies and I shall keep her despite everything."

Halpin's eyebrows lifted in surprise, and for the fraction of a second a hard glint came into his eyes. But he mastered himself quickly and fell to studying a blue print of an improvement to one of the *Space King's* motors.

"The *Space King* could make the flight to Ralé with ease," he said at last, straightening up from his task. "I could take her home and be back in a few months. It would be a bloodless victory for us and would forever settle this awful problem that faces us."

I glared at him. I understood that he was so mad with love for Omene that he would be willing to go to Ralé and live with her forever. But great as my confidence was in his scientific abilities, I did not deem it possible for him to fly so far as Jupiter.

"You are a fool to dream of such a thing," I snapped. "And I don't want you ever to mention it again to Omene or to me. If you do I shall make it hot for you."

Halpin suddenly grew straight and stiff. His abominable black coat—which he had worn the Lord only knows how many years—seemed likely to burst its seams as he swelled in his anger, and his black, blazing eyes bored into me like gimlets But the passion soon passed and he held his peace. That was the nearest he and I ever came to a serious quarrel. Afterward we had differences to be sure, but that they were not serious ones can be attested by the records of that space voyage many years later during which he saved my life. I may tell you about that later should you care to hear it.

"There is but one other alternative," he said finally.

"And that?"

"Is to fight them beyond the curtain—fight them with a fleet of space cars like the one we now have."

"IT would require hundreds of them," I said despairingly. "It would take but a dozen to vanquish any air armada they might muster against us."

"But they are armed with some sort of terrible explosive," I said. "And likely they have gigantic gas guns and devilish rays with which to overwhelm us. But we are without defensive weapons of any kind. So we would be a fair, open target for their thrusts."

"Maybe so," he replied, with a sly chuckle. "But we got safely through the meteor curtain, didn't we?" he added.

I stared at him as he continued to smile condescendingly. Once more my gorge arose, for I saw he was hiding some great secret from me. Yet I recalled with a thrill how easily we had sped through the careening meteors, sweeping them aside as though they had been downy flakes of snow. I understood that I must trust my friend implicitly, take his slights calmly and even bear his unwarranted liberties with Omene, for I began to sense somehow that in him and in the remarkable child of his brain lay the salvation of the world.

"Washington will listen to you now," I said finally. Just then the radio near us made known a new and horrible tragedy The entire waterfront at Atlantic City, thronged with thousands of bathers and other pleasure seekers, had been attacked from clear and smiling skies. Nearly every hotel had been razed, the famous boardwalk blown to bits, the beach furrowed and upheaved as if by a giant plow, the waters of the ocean raised into great columns of writhing foam. The list of the dead staggered the world. Hundreds had seen the dark, conical objects drop out of a clear sky. They had come in scattering showers, like rain drops, and extended up and down the beach for miles. The terrible messengers of death, whatever they were, seemed to have been born in the bosom of space and cast to earth by invisible hands.

## CHAPTER VII

## Hopeless Hours

THE President of the United States immediately convened his cabinet and requested the attendance of the nation's greatest scientists, but after a frenzied meeting lasting more than two hours nothing came of it other than for the President to call the Congress in extraordinary session to devise ways and means for checkmating this mysterious and unseen foe—if foe it were. Everybody demanded drastic action, but the servants of the people stared at one another blankly. No one had the courage to take the initiative. Indeed, the wisest did not even know how or when to start. Despair was crushing the souls of the bravest, and the rank and file of the masses were rapidly losing all respect for law and government. The superstitions and cruelties of the Dark Ages were being revived and embraced by the ignorant and the timid. The frantic appeals of all for a lucid explanation of the phenomenon met with no sane response, and meanwhile, the most powerful telescopes in the world continued to sweep the heavens in a vain attempt to solve the riddle.

As the United States of America had suffered far more from the unknown power than any other section on earth, the nations naturally looked to us for action. Our statesmen and scientists worked strenuously to satisfy the clamorings of the people. Congress was nearly paralyzed with bitter criticism and inexcusable attacks on its power and integrity. Working behind closed doors both houses were besieged by cranks presenting impossible schemes. High altitude aircraft of every size and style swarmed to the upper region of the atmosphere in a frenzied attempt to locate and destroy the bloody monster that was showering the earth with death. But nothing could ever be seen until the messengers themselves—some large and some small—were almost upon them. Many planes were hit and destroyed, thus adding to the people's frenzy and despair.

It was during these tense hours of hopelessness that Halpin and I suddenly appeared in the Senate chamber, a thing made possible by my influence with those in high command. As Halpin took his place by the chair of Alex Baldwin, president of that chamber, and held up his hand for silence, the clamor instantly ceased. Everybody seemed to recognize in his tall, angular form the advent of a savior. Yes, "Doc" Halpin, the despised and repudiated servant of his countrymen, was coming into his own at last. He seemed to sense his power, for as his black eyes swept the eager faces of his listeners, his face beamed with triumph. In fancy I see him even now as I write these lines; his long arms fanning the air as he drove home his arguments; the swing of his awkward legs as he tramped about the platform; the tails of that never-to-be-forgotten coat flapping about as he walked; the fire in his eyes and his air of

supreme confidence. Though I knew him better than any man there, I sat amazed and awed under the spell of his oratory.

"MY friends," he said earnestly, "there is no mystery at all about the present attack on our world. You have heard the rumors—how the invaders, seeking a new land, think to find it here on earth. Those rumors, incredible as they may seem, are literally true. Those large and flaming meteors, which we saw sweeping through our atmosphere a few months ago, were not meteors at all, as I have explained before, but giant space cars from Ralé, satellite of Jupiter. In some manner unknown to us, its people have learned that our earth is favorable to the development of human life. They sought to break through the curtain of meteors surrounding our globe, conquer the peoples of earth, and take our land for their own. But thanks to the meteoric stream they were unable to reach the earth, and they perished in the attempt. Maddened by their failure, they are now engaged in the insane task of trying to force a passage through the curtain for their space flyers—a hopeless task, for the meteor stream is constantly in motion and is constantly being reenforced by matter from the far reaches of space. But many of their bombs have found rifts and open pockets in the meteor train and, through these, have reached the earth. Thus almost daily we witness some terrible evidence of their presence and power.

"The numerous dark meteors recently reported by our astronomers are nothing but the space flyers of the enemy. Unless beaten back they will continue to come in ever-increasing numbers, and will shower their death-dealing bombs upon us until our world becomes a lifeless desert. Then at last will they succeed in breaking through and possessing it for themselves.

"But, my friends, dark as the present and the future seem, they are not hopeless! We will give battle to this destroyer—battle in the element of his own choosing, where he sails serene and unafraid, secure from our attack. *But we can break through!*"

He paused dramatically. In the solemn hush that followed his astounding declaration one could hear the pounding of one's own heart. No one seemed to breathe. Tense and rigid we sat, all eyes fastened on this dark-eyed man who proposed a great battle in space!

"I think I have demonstrated the truth of my words," he continued presently. "Give me twelve more space flyers like the *Space King* and I will sweep the enemy from the skies."

"Sheer nonsense," snapped old Senator Biggs, rising to his feet. "The inventor of the *Space King*—admittedly a wonderful craft of its kind—has allowed his imagination to run away with his judgment. The idea of the people of Ralé, as you call it, trying to reach the Earth is absurd. As to their quest after our Earth, that is more ridiculous still. We have no money to waste on such a foolish scheme as he proposes."

## Halpin Wins

MANY applauded this, but when Air-Admiral Richer, who had accompanied us on our trial flight, was introduced by Baldwin, a deep silence fell.

"Senator Biggs is wrong," he thundered savagely. "I have no patience with one of his viewpoint, for surely all the sad wreckage about the world eloquently supports Doctor Halpin's words. Halpin is right. Let us put our trust in him, for he will save us. I, myself, have ridden in his marvelous space flyer. I have witnessed its superb behavior in the meteor stream about which Halpin tried to tell us years ago, when in our blindness and conceit we would not listen. But let me assure you that that stream is very real and very powerful. It acts as a shield between us and the denizens of space. However, it is not impregnable to aerial bombs brought to our atmosphere by the strange people of a far-off world. As for their space flyers—I, too, have seen them, and as Doctor Halpin advocates, we must give them battle! To do so we must go through the curtain with a fleet of space flyers. There is no other way. We must do this or perish!"

Admiral Richer's remarks made a deep impression, though many voiced immediate and bitter disapproval. But Halpin again pleaded and argued with all the vehemence and power of his ardent soul, and at last, one by one, his critics were silenced and he won the support of the Senate.

Things moved quickly after that. In the short space of twenty-four hours a bill authorizing the immediate construction of twelve more space flyers modeled after the *Space King* was hustled through both houses of Congress, and was immediately signed by the President.

The next two months were times of feverish toil and heartbreaking anxiety. Every factory in the nation that could in any way contribute its mite was pressed into service and run day and night. Every man whose labor could possibly be used to advantage was employed. Meanwhile the deadly bombs still fell intermittently, but fortunately most of them struck in isolated sections and the loss of life was comparatively small.

At last the great space fleet was ready. The momentous word was passed from lip to lip and then radioed around the world. Halpin and I made a personal inspection of the great vessels to make sure that nothing was left undone to insure the success of our coming adventure. Although the ships had been hastily constructed, each was staunchly built, and each was an exact duplicate of the *Space King* in size and equipment.

The inspection over, I flew back to my Adirondack home and informed Omene that on the morrow our fleet would take the air to battle the space flyers of her home world. She manifested no surprise at the news, asked no questions and made no comment. She still maintained that cool and detached attitude toward me which was the sorry aftermath of my treatment of her. But I was painfully aware that her cold reserve always melted whenever Halpin was near. And it was both necessary and courteous to leave them alone at times.

ALL that night I lay awake—hot, restless and sorely troubled. What the morrow had in store for me I could not guess, nor did I care a great deal. I had resolved to go with Halpin, who was to command the *Space King*, flagship of the fleet. Somehow I felt that I must win back Omene's confidence and affection before departing on this venture which might cost me my life. I could not bear to leave her without obtaining her forgiveness and bidding her good-bye. Yet I dreaded to approach her with offers of peace. So far, I had proudly left her alone, trusting time to heal the wound. Now I must face the scorn of her proud spirit, the fire of her wonderful eyes—and I was fearful of the outcome.

I found her standing by a window gazing out to the south. I knew she was watching for the *Space King*, for Halpin was to pick me up here.

"Omene, I have come to say good-bye," I said in a low voice.

She turned quickly with flashing eyes, but otherwise manifested no concern.

"I may never return," I went on. "I may be killed."

"That is possible," she said coldly. "But remember I am not sending you forth to fight my people."

With that and a haughty tilt of the chin she turned back to the window.

I went up to her, placed an arm around her round, soft shoulders, and gazed entreatingly into her face. But she did not deign to notice me. A silver speck in the south had appeared in the pink dawn of the sky. Rapidly it grew larger. The *Space King* was coming on at a terrific speed. In a few more minutes I would be aboard and off on my perilous mission.

"Come, Omene, kiss me good-bye," I entreated. "What have I done that you should treat me so coldly?"

But she pretended not to hear. And then, almost before I realized it, the great silver bulk of the *Space King* loomed close in our vision as the ship gently settled to the lawn just

as the rim of the sun peeped above the hills.

"Good bye, Omene," I said hoarsely, as I turned away with a heavy heart. I must hasten—Halpin would not wait. As I hurried down the lower hall, I saw Tom standing by the doorway, staring out at the ship.

"Now remember, take good care of Omene, Tom," I said as I brushed past him.

A door in the ship's side slid open and Halpin met me with a smile.

"Get your binoculars, Zane," he said hurriedly. "Like a dunce I came away without mine."

As I turned back to the house I cast a swift glance upward. Omene was standing with her face pressed against the window pane, gazing down at the ship. Poor little soul! My heart ached for her. She was thinking of her home and her people. And I, while pretending to love her, was going out to fight them to the death!

"Get my binoculars, Tom," I shouted as I entered the hall. "They are in the top drawer of my desk."

Tom was halfway up the stairs, but he ambled down quickly and went after the glasses. These binoculars were especially powerful and had been made to order for space observation. Halpin had their mate, and how he had managed to forget them was a puzzle, for he always thought of everything. Also it was funny that I had forgotten mine. Tom was gone a long time, I thought, for I was nervous and impatient. Presently he returned.

"They ain't there, boss," he said. "And I can't find them nowheres."

Then I remembered having had them in the library the day before. I ran and secured the glasses, then hurried from the house, for I was delaying the whole project. I looked again toward Omene's window, hoping to get one more last look at her loveliness, to wave a last good-bye, but she was not there. With a bitter sigh I turned to Halpin, who stood by the open door of the ship, still smiling, but I sensed that he was irritated by the delay.

"They are waiting for us," he said simply as the door closed noiselessly behind me. Then came a low, indistinct hum and I realized that we were under way.

## The Fleet Ascends

SO tremendous was our speed that the sun was barely clear of the horizon when we circled over the New York landing-field and signaled the fleet to join us in the air. Then upward they swung, a magnificent spectacle of power and beauty, those twelve leviathans of the sky, with the sun gleaming and flashing on their silver sides. Below us for miles in all directions millions looked up and cheered madly as we mounted into the blue.

It was a beautiful morning, the air still and soft, and as we darted upward at a sharp angle it looked as if we were bound on a fruitless errand. No enemy was visible. For several weeks no explosives had fallen on the earth, and the astronomers of all the larger observatories had failed to discover any more of the dark, mysterious bodies circling the globe above our atmosphere.

"This looks like a wild goose chase," I remarked to Halpin as we stood in the control room staring into the void.

"Maybe," he said laconically. "Perhaps the varmints have gone back home. But we shall see when we get above the curtain, and if there are none there to meet us we'll have to hunt for them."

I was still in the dark relative to our method of offense and defense against the enemy, though I knew that all our ship captains and crews had received their instructions. I had faith in Halpin's wisdom and skill, yet I was fearful of the outcome. Our numbers were few. I was confident that should we sight the enemy ships we would find ourselves greatly outnumbered as well as outclassed in size, for, according to all evidence and the glimpse we had had that day of the cars from Ralé, they were gigantic affairs and the power and size of their armament I conjectured accordingly.

In a few minutes all the ships were safely through the curtain and were riding free high above it. Here we went into battle formation, though there was no enemy in sight—nothing but blank, empty space, and far below the dark blur of the Earth.

At Halpin's command we halted and hovered there practically motionless. He took my binoculars and swept the sky in every direction. His face was grave and I saw that for once he was puzzled and worried. We had come up to fight our enemy, to save the world, and there was no enemy there!

"We will circle the globe and keep a sharp lookout," he radioed his commanders. "If we find no enemy at this level we will go higher."

So around the world we sped—with utter darkness on one side and brilliant sunshine on the other. But we were alone in that great, empty realm of space. When our instruments registered that once more we were above New York we again came to a halt.

"For some reason the enemy is keeping further away," said Halpin. "We will spread out a little."

So we shot away more than five hundred miles, then paused to reconnoitre. Halpin carefully scanned the heavens about us, then handed the glasses to me with a sigh of disgust.

Nothing met my view but that black void, stretching out cold and lifeless.

The heart-breaking cheerlessness and emptiness appalled me. Never before had I looked on such desolation. I felt that the hot, gray death of the desert was much to be preferred to this hopeless, all-pervading, all-enveloping silence of cold nothingness. Then, tired of my hopeless survey, I paused, staring fixedly ahead. I blinked, thinking that the long eye strain was playing me a joke, for suddenly it appeared that a small section of the black sky had separated from the rest: that it was moving, coming toward us by leaps and bounds. Back of it and around it appeared other objects of like size and character. As I gazed, all assumed regular proportions and rapidly took on the shapes of giant eggs. I recognized them! *The space flyers of Ralé had camouflaged themselves against the sky!* Under this disguise they had hoped to creep upon us unaware. That meant that they must have returned to Ralé and come back here since we had seen them last.

"HERE they come!" I gasped, handing the binoculars to Halpin. He took one long look, then turned to me with a sardonic smile.

"They've tricked us," he said soberly. "Someone—" He paused staring at me intently.

"Omene!" I exclaimed hoarsely. "It hardly seems credible, but you know she's always tinkering with the radio. That machine you brought her—she's made a transmitter out of it and—warned her people! She—"

"Hell!" he exclaimed, looking at me with a sheepish expression. "I never thought of her doing such a thing! But then—"

He stopped abruptly and began issuing his orders to the fleet. In less than a minute's time all had taken their positions. We were spread out in a long, irregular line at different altitudes, to confuse and divert the aim of the enemy.

By this time the ships of Ralé had drawn so close that, although they were of the deep blackness of the sky and seemed to blend with it, we could see them plainly. Breathlessly, and I confess with not a little trepidation, I counted them. They numbered four score, and each was so large and formidable in appearance that I fancied any one of them might swallow our whole puny fleet, and then, unsatisfied, look around for more. They were still perhaps ten miles distant and perhaps five miles above us when they went into battle formation and then came on in the shape of a giant V. Still our fleet hovered there in silence, inactive. Looking from the ports I could see no sign

of life about it. It looked as if we were to remain there poised in space and be annihilated without striking a blow. I looked at Halpin. His face was a mask. But there with us in that control room stood the officers, tense and silent, with their hands gripping wheels and levers as they awaited the word.

Once more anxious and fearful, I looked toward the enemy fleet. I started back with a gasp. In that clear world of space where there was not even air it seemed that I could almost reach out and touch them! Nearly three hundred miles above the Earth the space flyers of Ralé were hurtling down upon us. Far below, the meteor train swirled, eddied and plunged in its endless voyage around the Earth.

And now the enemy ships suddenly halted, broke formation and took positions much like our own. Then they came on—great battleships of the air—and I felt that we were doomed. Just then Halpin pulled a lever. Looking through the thick, glass port I saw that our sister ships were now enveloped in a mantle of white, brilliant, leaping fire through which blue flames darted and quivered, sending their writhing tongues outward for a dozen yards. From stem to stern this dancing, leaping fire blazed and scintillated over every ship, thus hiding it from view. It was our defensive armor used against the meteors, but I doubted its efficacy against this foe.

Suddenly ports opened in the bows and sides of the attacking fleet and from them belched a perfect avalanche of projectiles and bombs. Several of the space flyers took their position above us and sent down a veritable rain of explosives. So large were the bombs that they could be plainly seen as they came smashing down, only to be met and consumed by our living, pulsating armor. And the immense gas shells of the other members of the fleet met with no better fortune. Striking us with terrific force, they exploded harmlessly beyond the shimmering pulsating envelope that surrounded us.

## Halpin's Weapons

AFTER a fierce and incessant attack lasting perhaps fifteen minutes the ships of Ralé withdrew a few miles, apparently awed and terrified by the futility of their attack. For not one of our ships had suffered harm! We had not even changed our position. We lay there silent and disdainful, arrogant, unafraid, issuing our challenge to the enemy to come and take us.

But if we had suffered no losses, neither had our foe. Was the enemy to escape unharmed, to come back at his leisure and once more shower the Earth with death? Then I saw that the great, black ships were coming on once more. They drove forward seemingly without order or purpose, but I noticed one ship, perhaps a third larger than the others, that appeared to be the leader. Fascinated, I watched them as they shot forward with terrible speed. I saw that their intention was to ram us, to overwhelm us with their gigantic bulk. I knew that we must turn and fly from this onrushing armada of destruction—shameful as such a thing would be—for surely our ships, stanch as they were, could never survive the awful impact of those careening monsters. We would be crushed like egg shells to fall, a mass of wreckage, into the meteor stream.

Still not one of our fleet moved so much as a hair. Calm and serene our glistening ships lay there in the emptiness of space. I became so nervous that I could no longer stand still. Pacing up and down I stared at Halpin in dismay. Was he going to allow us to go down to an ignominious death without striking a blow? Was he deliberately committing suicide? His face was inscrutable, but his eyes glittered ominously. I feared he had gone mad. I glanced at his lieutenants. Each man's face was set and stern as, with eyes riveted on the master, he waited. . . . Then, suddenly, as I watched the onrushing horde, I was aware that Halpin made a slight movement—I but glimpsed it and heard no sound. All was deathly still. And then I saw one of the black monsters burst into flame and blow up with a detonation whose soundlessness was more terrific than any audible noise. Of course in airless space there is no sound transmission. As I gasped in astonishment, I saw twelve more of the enemy craft explode, scatter far and wide in flaming brands as they fell in great showers of fire.

With a sigh of gratitude I turned to Martin. I knew what had happened to those black space flyers. Halpin's marvelous ingenuity had contrived a death-dealing, invisible ray which had stabbed its way through our protecting envelope clear to the vitals of the enemy, and there ignited the gas bombs and chambers which undoubtedly formed a large part of the Ralian space flyers' construction and equipment.

Checked and stunned by our unexpected and terrible weapon, the enemy whirled about and rapidly withdrew, but those relentless rays followed them on. Ship after ship dissolved in a great burst of fire and smoke until all about us space was aflame with the plunging fragments. And now in the midst of this fiery spectacle, Halpin commenced to dance like an urchin over a new and coveted toy! Swinging his long arms up and down, he paced up and down the control room, his coat tails flapping grotesquely and slapping his legs as his contortions increased. It was the only time I have ever seen his equanamity really disturbed.

BUT suddenly the space in front of us cleared. The burning fragments went drifting below and the remainder of the enemy began to re-form and return bravely to the attack. There were less than a score of space flyers remaining, including their giant leader which was in the van.

Halpin ceased his gyrations, signaled his commanders and bent over his controls.

"Watch me fix that fellow," he said grimly, his eyes on the great magnifier in the bow.

We watched breathlessly, but even as I stared over his shoulder, and his hand reached down for the switch, a white, bare arm shot past me; long, white, sinuous fingers clutched his wrist and he was jerked back, just as a shrill scream echoed through the room

I turned swiftly, then recoiled, unable for an instant to credit my senses. Stunned and frozen to inaction I stared agape. For it was Omene who was holding Halpin's wrist! Omene, glaring at him with blazing eyes! Then in one swift rush of indignation and anger I understood. Halpin had sent me back into the house after the binoculars as a ruse to enable Omene to escape through the window and be secreted on the ship!

"What's the meaning of this, Martin?" I asked him severely. "Why have—"

Omene turned on me like a tigress.

"Doctor Halpin is a gentleman," she said bitingly. "He is always ready to aid a lady in distress."

For a moment Halpin lost his habitual coolness. He glared at me, then wrenched loose and again reached for the controls. But the girl leaped upon him furiously and dragged him back with surprising strength.

"My brother, Prince Satso, commands the big ship," she shrieked. "Spare him! Spare him!"

"I am sparing him," said Halpin tensely. "I have not forgotten, but you have forgotten. Why did you leave your place of concealment?"

The girl's eyes dropped as she released him. He stood panting before her, gazing at her wistfully.

Beside myself with amazement and anger, I stood motionless. I could not understand why my friend had done this thing, but for the first time I began to understand the depth of his love for the girl. Nothing but an absorbing passion would account for such madness. But what was his object in smuggling her aboard the ship without my knowledge? Did he really contemplate taking her home after the battle? Incredible as it seemed, such must have been the case. Then a great white, hot truth flashed through my mind—his love was not

selfish! He would take the girl home even though he knew that by so doing he must lose her!

I STILL loved her madly despite her recent coolness toward me, and I determined to thwart his plan. It is my belief that the scheme had been for her to remain in hiding while, under pretext of studying conditions in outer space, Halpin would drive on toward Jupiter. But probably she had observed the trend of the battle, and, anxious for her brother's safety, had emerged from her retreat to fight for his life.

I glanced through the bow magnifier. All space in front of us was full of flying fire, aglow with the dissolving ships of Ralé. They were all gone, I exulted, but as things cleared a bit I saw the ship of Prince Satso about a quarter of a mile below us, still unharmed. He alone had survived. All his proud and powerful companions were falling in blazing fragments and scattering sparks toward the racing meteor stream. I realized now that our commanders, obedient to Halpin's orders, had withheld their rays from the Prince's ship.

Once more Halpin reached for the switch, but the girl, misinterpreting his action, clung to him desperately.

Reluctantly I seized her arms and drew her away. Then, in a flash, I saw what he would do. Purposely he had spared Prince Satso, and now he would place Omene aboard his ship and send her home—home as a messenger of good will and peace from the Earth! A rush of shame swept through me as I realized that Halpin, much wiser than I, had seen that homesickness was eating the heart out of the girl; that unless she could soon reach her people she would droop and die. It was not in my mind to condemn her now. Those were her people and she had the spirit to fight for them. This made me love her more.

"Forgive me, Omene—" I began, but I saw she had disappeared.

I started to look for her, but Halpin took my arm in a warning gesture. I stood still. Five minutes passed and then a door opened and in walked a strange figure, the sight of which caused me to reel dizzily. It was Omene, no doubt in the space suit that I had first found her in. She clutched, in her metal-covered hand, the gravity nullifier that had lain beside her head on that winter night many months ago.

How had she obtained the suit? Had Tom been in league with her—? My conjectures were cut short, for, after pausing motionless in front of me for a brief moment, she turned, resolutely it seemed, toward a door leading to the air-lock. And as I stumbled after her in alarm, calling on her to come back, she pressed a button and a small door slid aside. As I realized with a shock how much Halpin had hidden from me, how he had made her familiar with the ship, she sprang into the opening! Horror-stricken, we saw the door close, and an instant later she was off in space, floating down toward her brother's ship. Gasping with amazement, but impotent to do anything, Halpin and I looked from the window and watched her go gliding down, down, until she was near the black ship. Suddenly a door in the space flyer flew open, and by working herself over by hand-holds on the surface of the ship she reached the door and disappeared. And thus vanished from our sight forever the most beautiful and alluring woman this Earth has ever known.

Heartbroken as we were over the loss of Omene, we were well satisfied that her brother had escaped, and when we saw his great ship point its nose toward its far off home we both breathed a deep sigh of relief. Smaller and smaller the ship became until it was just a dot in the distance and faded out of sight.

Without a word we turned back to the control room and began the descent to the Earth.

I need not bore you with the details of the great reception that awaited us, of the thousands of words of praise and adulation that the world attempted to pour into our ears. But in the midst of it all Halpin disappeared, and it was months before I saw him again.

Yes! We had won a complete and sweeping victory, for never again did the space flyers of Ralé seek to conquer the Earth. Halpin has only one regret which he expresses with a new, wistful smile: "If I only knew how those ships were propelled!" But for me there is an unsatisfied, inexpressible longing that becomes most intense as I look through my telescope each night to Ralé, satellite of Jupiter.

THE END.

# WHAT IS YOUR KNOWLEDGE OF AVIATION?

*Test Yourself by This Questionnaire*

THE questions given below are taken from the stories in this issue They will serve, by your ability to answer them, to test yourself in your knowledge of aviation. By thus testing yourself, you will be able to fix in your mind a number of important facts of aviation that are presented by the stories.

The pages, on which the answers are given, follow each question.

1—Can an airplane move by creating a vacuum in front of it? How? (Page 913)

2—What is one of the most serious obstacles to interplanetary travel? (Page 871)

3—What is the usual speed of meteors, and what happens when one of them strikes the earth? (871)

4—What is the purpose of a gyroscope in a plane? (Page 899)

5—What means of propulsion seems at the present time to be the most feasible for interplanetary travel? (Page 903)

6—How high can small balloons, without weights attached, ascend into the atmosphere? (Page 940)

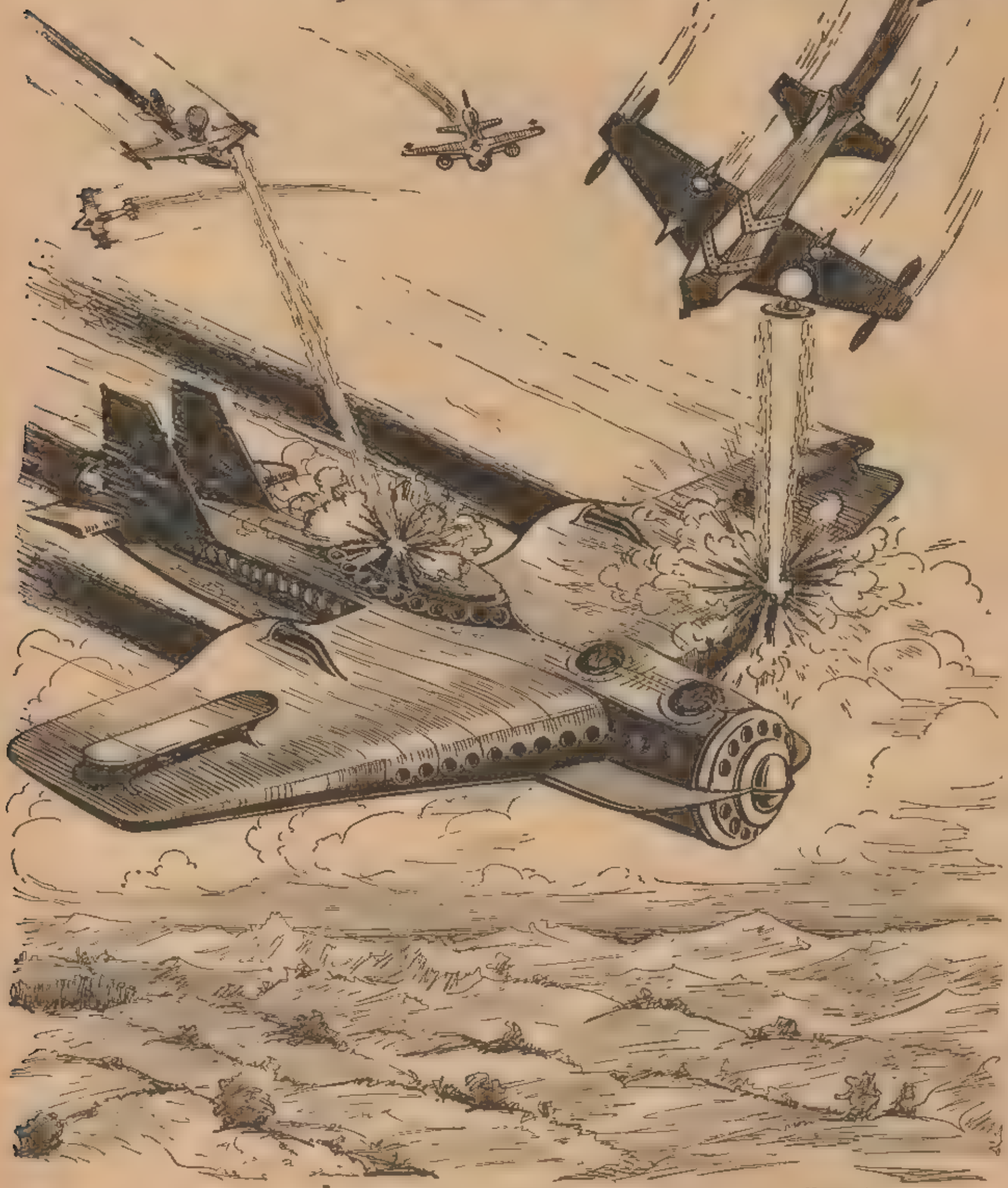
7—Would the atmosphere at an altitude of 25,000 feet keep an aviator alive? (Page 940)

8—What is the pressure of the air in pounds per square inch at a height of 7½ miles? (Page 940)

9—What happens to the lifting power of the wings and the power of the motor at high altitudes? (Page 941)

# The Heat-Ray

by O.L.Beckwith



*(Illustration by Leonard)*

When the crash occurred, they stated that they had observed flashes of intense light vomiting from the attacking planes. Two hundred men were killed or injured.

# THE HEAT RAY

## *By the Author of "The Robot Master."*

### PART ONE (1938)

THE room was pitch dark, save for a slender finger of light that issued from a tiny aperture in the ceiling and fell straight into a funnel-like receptacle on the dimly seen table. Only the upper part of the receptacle, however, resembled a funnel; the lower part had the vague form of a moving picture projector. The room itself, so far as could be made out in the very faint illumination, was fitted up as a laboratory. It was crowded with chemical paraphernalia — retorts, test-tubes and other articles that were thrown roughly about, helter-skelter, on wall racks, standards, and the littered floor.

There was a movement beside the table, and for the first time it might have been seen that the room held a human occupant. Earnest, weary-eyed — Anton Babel was engaged in an experiment.

His long, deft fingers drew back, carefully and swiftly, a little slide on the out-thrust muzzle of the mechanism on the table, while with the other hand he pressed a button on its nearer side. From that muzzle a pencil of warm, yellow light shot out, touched the further wall, and then disappeared as the man released his pressure on the button. The air seemed suddenly very close and humid.

Babel strode quickly to the other side of the laboratory and seized an L-shaped trough about ten inches wide, with the upper side of the L some five inches long. This, together with a cylinder of iron, two pieces of phosphorus, and a square of wood, he carried back to the table. He placed the trough upright near the table's edge, in line with, and nearly three feet from, the muzzle of the projector. In the center of the trough he arranged the pieces of phosphorus, then moved again to the machine and repeated his former motions.

As before, the yellow beam flashed immediately into sight, and simultaneously the pieces of phosphorus flared up in a blaze and were gone. Babel then tossed the wood to the same position, and intently observed the action of the beam upon it. The result did not vary in the slightest degree from that of the first test. The time of ignition, so far as could be seen, was exactly the same

Hardly able to contain his exuberation, the experimenter ran to the door of his laboratory and flung it open.

"Adams!" he called. "Adams!"

Twenty yards away across the lawn the door of an outhouse opened, and a spectacled head was thrust out.

"Adams!" reiterated Babel. "Come here quick—I've something to show you!"

Obediently a lanky body followed the head into the open, and Samuel Adams, undergraduate assistant to Babel, hurried across the grass and into the open portal of the laboratory.

"What is it?" he asked, panting a little.

*WHEN the first stage-coach plodded its way across the western prairies, attempting to serve as a means of communication with a newly populated land, it had to face the menace of criminals of all kinds. The same thing has been true of the steam train and automobile, and will certainly be true of the airplane. It is peculiar, too, that the latest scientific devices usually come first into the hands of those who least deserve them, and the forces of law and order are always several steps behind in their adoption of new weapons in their attempt to combat criminals.*

*It is quite possible that the weapons used by airplanes of the future, whether in combating criminals or in warfare, will have a long range of action. Machine guns will be quite useless with planes which can ascend and descend with almost lightning-like speed.*

*Mr. Beckwith, in his quite remarkable story, gives us an illuminating picture of what some of the future developments are likely to be.*

O. L. BECKWITH

Babel gently touched the projector.

"It's this—a heat concentrator."

"Yes? But what does it do?"

"Watch!"

Babel was almost bursting with exultant pride. It was with some difficulty that he now placed the cylinder of iron in the trough and applied his finger to the button. The yellow ray sprang out, reached the cylinder and for a moment seemed to caress it softly; then, before the astounded eyes of the two men, the heavy iron was *melting*, melting in a white-hot pool that spread, steaming, for an instant, then as swiftly hardened again.

ADAMS blinked, and rubbed his glasses.

"That iron isn't really melted, is it?" he cried. "It's just a trick—" and before the stupefied Babel could prevent him, he thrust his hand toward the metal —thrust it full into the yellow beam.

Adams let out one horrible cry, and the room was full of the odor of burning flesh. Babel caught him around the shoulders, but he did not fall, only stood there as if spellbound, looking down at the blackened thing that had once been his hand. Babel was nearly hysterical.

"Hold on, Sam!" he half-screamed, quaveringly. "For God's sake, hold on! Can you sit down? Can you sit down? If you can sit down, I'll call a doctor. Can't you speak? Can't—"

Adams jerked himself free, and in one staggering rush was across the room. Words now came in a flood from his lips.

"It'll never hurt anyone else! Damn it—damn that thing! I'll fix it!" He had caught up a wrench and was coming back toward the table. "Never burn anyone else!"

Babel caught his upraised left arm and held it.

"Stop it—drop that!" He was aware that Adams did not hear him, and he spoke no more, devoting his energies instead to pulling the wrench from the crazed man. There was a confused tangle of arms and legs—from somewhere the wrench had come into his own hand and he tried to throw it over the other's head; and somehow an upflung arm had deflected it and crashed it down. . . .

Babel stood alone and looked down at the inert mass lying at his feet. Once he whispered, "Sam." Then he laid a hand gingerly on the silent figure. Precariously balanced, it rolled half over and into the light from the doorway. The head was split.

A voice said "Murderer!" in Babel's ear, and he swung around, feeling in that moment a detaining hand laid sternly on his shoulder. There was no one. The yard and the laboratory were empty—save for that shapeless thing. . . .

Like some wraith, Babel tiptoed over to the table, caught up the projector and a portfolio of papers, turned, and went softly out. A moment later came the roar of a powerful motor, and a small airplane went swiftly aloft, its helicopter screws

spinning madly. Then it disappeared in the sky.

And so the Heat Ray came into existence. Born in blood it was, and nourished upon slaughter and destruction; and the evil record of its achievements was to grow and expand until a nation trembled before the menace of its yellow, molten beam.

## A Scrap of Paper

"TELEGRAM for you, Ant!" The speaker was Jesse Farnis, roommate of Anton Babel; the place was Stanford University, California; the time, two o'clock in the afternoon.

Young Anton, just back in his room after a tiresome two-hour session with chemistry, looked up lazily.

"If you're kiddin' me to grab this chair," said he, "somebody's gonna be carried out of here. . . ."

"Honest. It's under my trig, there. Came about ten minutes ago."

"Give it here!"

The other complied, and Anton tore open the yellow envelope. He read:

*"Expect me four o'clock Wednesday. Must see you. Will explain on arrival.*

DAD."

Anton Junior whistled.

"Somethin' troublin' the old man," he said. "He can't have heard of my bustin' up the plane, can he? No—and besides, he wouldn't come clear across the continent for that. I don't understand this—at all. H'm."

"You'll understand something else again," advised his friend, "if you don't get out of here. You've got an English conference at this hour, young fellow. You told me yesterday to remind you about it."

"So I did," said the other. He got up, sighing dolefully, slouched down two flights of stairs and out onto a sidewalk. He walked slowly, humming, for it was a glorious day.

As Anton Junior went up the old concrete walk under the spreading trees, a couple of thousand miles east of him a man in shirt-sleeves was striding hurriedly down Michigan Avenue in Chicago. Under one arm he carried a portfolio; in the other hand was a bulky bag. As he walked it could be seen that a sheet of paper was slowly edging itself out of the portfolio, moving inch by inch with the regular swing of the man's arm.

A messenger boy came out of a cross street just in time to see the paper fall to the pavement. Being honest, he called out sharply and touched the man on the shoulder. The resulting phenomenon furnished him food for thought for some weeks.

What the messenger boy had said was: "Hey, mister, you've dropped somethin'!" But the man in shirt-sleeves evidently misunderstood him very seriously, for at these words he turned around a fear-tortured face, and beholding a uniform—however small the wearer—within grappling distance, he took swiftly to his heels, nor did his baggage seem to hamper him to any great extent in performing this athletic feat.

THE boy watched him with some amazement, then stooped to pick up the document, but it was suddenly gone. One of those little whirlwinds, which resemble miniature tornadoes on hot days in the country, had picked it up and carried it, eddying and twisting, through an open window of a tall office building fronting on the street. It dropped very nonchalantly upon the wide desk which overlooked the window; and Fate, seeing that matters had come about as she had planned, left it there.

Now John Merton Graves believed in Fate, and he accepted the paper in the same mood in which he had received a quiet hunch to stay later than his usual wont in the big office building that fronted on Michigan Avenue. As it happened, John Merton had no right to be in that building; in fact, if certain members of an efficient Chicago police force had known of his whereabouts, they would have quickly taken steps to see that he was furnished more suitable quarters. For John Merton was a criminal; what is more, he was one of those called by fictionists "master minds." His quiet insurance business was nothing but a clever mask to cover his more flourishing activities outside the pale of the law.

He read the paper through—and instantly, complete as though it had been conceived centuries before, a Napoleonic plan leaped into his fertile bram. It was to take him three years to put it into execution, and eventually to cost him his life, but John Merton Graves neither knew nor cared for these things. Instead, because of the mental agility that was habitual to him, he began at once to build the framework for this structure of his thoughts.

We who spend our lives in offices, in stores, in factories, on farms, can have no conception of the tremendous power wielded by the head of one of our many modern criminal bands. His immense authority is second only to that of the super-gangster who controls the underworld of a whole city, and emperors of old might well have had reason to envy such a one. In him absolutism has reached its peak—there are no parliaments to curtail his prerogative, no rebel people to rise up against him, only a few powerful henchmen to be subordinated. Graves was a man of this type: a type almost entirely the product of modern civilization. And it is not surprising, under these circumstances, that John Merton found means to track down the writer of the paper that had fluttered into his window.

His ways of accomplishing this were devious, innumerable. By a simple process of elimination he discovered who had written the paper. He knew that only a few men in the world could have written it, and his mind disposed of them one by one. He alighted at length on Anton Babel. His men it was who first found the body of Adams, Babel's assistant, in the laboratory to which they had gone to search for him; it was his men who followed the trail of the scientist's big plane across the country to the dealer's shop where it had been disposed of; and it was they who flew behind the worn out Babel in his new plane, when the inventor came at last to Leland Stanford University.

To be precise, it was not only John Merton's men who were flying two miles behind Anton Babel; it was also John Merton himself, and two of his best lieutenants. No one could say of him that he ever failed in any undertaking because he intrusted important work to men who were not capable of doing it.

Down to the landing field they went, following Babel by half a minute. They were not a half dozen steps away when they saw him motion to the nearest taxi, and they plainly heard him give the address of his son's fraternity house. Babel entered the cab and it drove off; behind him the three men engaged another car, promising their driver an extra fare to follow the first conveyance. It was easily done. When Babel's cab stopped at a pretentious Greco-Roman mansion, the other one was not fifty yards to the rear.

## A Mistake in Identity

STEPPING to the ground, the inventor strode into the building, accosted the nearest student, and followed his guide to Anton Junior's room. Once inside, he sat down, sinking completely out of sight in one of the soft Morris chairs. He closed his eyes, for he was very tired, having slept very little for four nights.

Down below in their taxi, the three conspirators debated the next course of action. Opinion was divided: John Merton, unusually audacious, argued that it would be better to keep in sight of Babel, while his two lieutenants held that, since the scientist could not guess that he was being dogged, it was the part of discretion to wait until he came out again. They were not at all sure why Babel had come to Stanford University; even less sure why he had come to this exact spot. Somehow, in spite of the intensive search of John Merton Graves into

the private life and affairs of his quarry, he had not come upon the fact that Babel had a son. This error was destined, in time, to prove an important element in later events.

Graves won at last over his reluctant comrades, and they formed a plan of battle. John Merton was to enter the house, to inquire after Babel, to find him, to take that for which they were searching. The other two were to dismiss their first taxi, and, by taking advantage of a near-by telephone booth, to order another, which was to be at the door of the fraternity house in five minutes. Then, when John Merton came out with the booty, a convenient and almost untraceable method of escape would be ready for him.

Graves opened the door of the house and entered. Night was fast coming on, and in the dusk he nearly walked into a student, who was lounging out of his chair to turn on the lights.

"Pardon me," said John Merton. "Did Mr. Babel just come in?"

The youth wrinkled his brows. "You mean Anton?" he asked.

"Yes."

"Why, no, I didn't see him."

"Are you sure?" persisted Graves. "I was positive I saw him."

Well, maybe you did. I'll take you up to his room, if you like."

"Please."

The two went up the stairs and to the open door of Anton's room. Graves, seeing the head above the dim back of a chair, said, "Ah, I thought so," with much satisfaction, and gently but firmly closed the door behind him as he went in.

Then he moved to the front of the sleeping man and stood watching him intently. There was a suit-case by the side of the sleeper, but Graves did not touch it.

Instead he whispered, "Mr. Babel!"

The figure stirred.

"Babel!" repeated John Merton. "Anton Babel!"

The sleeper was wide awake now; he lifted one hand as if for defense.

"Don't arrest me," he said, weakly and hopelessly. "I didn't mean—I couldn't help—"

GRAVES laughed. "That's all right," said he. "Brace up, now, and we'll talk. I've no more love for the police than you have."

"You mean—"

"I'm not in the habit of beating around bushes," said John Merton, pulling up a chair to face the other, "and I'll not do it now. What I want is your heat-concentrating contrivance, and its formula, and any other papers that may deal with it. If you're decent about it, I'll offer a thousand for the whole thing. If you're not, why—" Graves spread his hands wide—"I'll have to turn you over to the police."

"Then—it's blackmail?"

"Come, come," impatiently, "I told you I'd offer a thousand. That's generous—considering that I could get it for nothing if I really wanted to."

Babel thought a moment. Then he spoke, slowly: "I don't know how you learned about my invention, and I don't know who you are, but I do know this—that you can't have it!"

Graves shrugged. "Just as you say. I think, though, that I'll go down and phone police headquarters."

Babel, getting to his feet, walked slowly over the window and stood, looking out. It was pitch dark outside, and from all over the campus little flickers of light gleamed—house windows, and street lamps, and car lights. He turned back to the room.

"Do you know," said he, "I think you're bluffing. I don't believe you would want the police up here any more than I would myself."

"Oh, don't you?" said John Merton, softly, with an ugly little sneer on his lips.

"No."

Suddenly both of them heard running footsteps on the stair. The quick slap of soles striking carpet was accompanied by a tuneless, happy whistle.

"Anton!" cried Babel, and he took a step toward the door.

John Merton made two movements simultaneously. He jerked a heavy automatic from his pocket, fired—and leaped to the light buttons. He fired again, twice, in the sudden darkness, and the soft-nosed bullets made a horrible, thudding sound.

Anton Junior opened the door on a sight that he was never to forget. The room was lighted by a soft beam of moonlight that came through an uncurtained window, and in the very middle of the beam, appearing as if detached from its body, was a human head, lips drawn, teeth clenched, the whole a picture of beastliness incarnate. He saw only dimly the rest of the body; perceived a pistol held in one hand and a suit-case dangling from the other; then there was a lancing flame, and he saw only darkness . . . and darkness. . . .

## PART TWO (1939)

COPY of a letter sent by Professor Matthew E. Winton of the Howland Institute of Technology, to his brother, Jamison Winton:

"My dear Brother:

Today I have taken one of the most decisive steps in my whole career. In writing to tell you of it, I will give you the exact details, as nearly as I can remember them, and you may judge for yourself of the wisdom of this action. If you think it wise, you will of course accept the proposition that I intend to state further on.

"Yesterday morning my man brought in a middle-aged gentleman, very well groomed, and with that prosperous look that most successful men have. He told me his name was John Merton Graves. I faintly remembered having heard the name before, and I spoke of this. He grinned and answered: 'My name is often in the newspapers—but very little good is ever written of me'."

"When I questioned him as to his seemingly paradoxical answer, he replied: 'I am a gentleman carrying on an extra-legal profession.' You may judge my surprise, my dear brother, when he said that. Instantly I jumped to the conclusion that he intended to rob me, and I told him I regretted it very much, but he would hardly find a dollar in the house.

"'You pain me, Professor Winton,' he said. 'I'm not that much of a piker. I'm not going to rob you at all; rather, I'll enrich you.'

"Said I: 'I don't know what you mean, sir.'

"Then he explained. I give you my word, Jamison, my head positively swam with the things he told me, though I'm by no means a man easy to surprise or awe. It seems that he has stolen an invention from a man—I forget the name, something like Bibil, I think it was—that works on the principle of a giant burning-glass. A beam of sunlight enters the top of the contrivance, and is reflected downward from there by a series of mirrors until it is imprisoned between two of them. This, you know, has always been theoretically possible, but because of defects in the mirror-glass, could not be accomplished practically. This inventor, however, has perfected a type of glass that is flawless, or, one might say, a type whose reflecting surface is a perfect plane, so that the two mirrors hold the sunbeam quite well. But this is not all.

"BY operating a slide, one of the mirrors is tilted up and the beam shoots out beneath it. In some manner (I haven't yet read the whole of his formula) he manages to secure an immense concentration of that beam, so that is has nearly fifty times its original heat. This beam, concentrated as it is, can be thrown out through a projector and turned on

any object desired. You may doubt this—as I did—but that object acts as it would if it were only a few feet from the intense heat of the sun—in other words, it either melts or instantly burns up—depending, of course, on the type of material of which the object is composed. The range of this weapon is somewhat limited, for it loses a great deal of its heat through contact with the air, but the one that Graves had is able to ignite wood at two hundred yards. This, with only a momentary flash. If it were held on for some seconds, iron or steel would be melted, granite blocks cracked into tiny chips, and so on.

"You can see what possibilities there are in this thing. With larger glasses constructed and installed on vessels, airships, and other war conveyances, an enemy could be wiped out almost before a shot was fired. It practically makes guns extinct. And I think I can find a way to eliminate its only fault—its uselessness at night—by perfecting a storage tank for sunlight with which the thing would be equipped.

"This was not all that Graves told me. He has very little scientific knowledge himself, and he wishes some skilled electrical engineer, and a trained scientist who can interpret the inventor's notes, to make more of these heat concentrators for him. What he will use them for I don't know, but from some hints that he dropped I gathered that he plans to transform his gangs of rum-runners, drug-sellers and the like into a band of air bandits, who, using fast planes and armed with this heat ray, will prey on air and land shipping. He was careful to tell me that there would be no danger for the makers of his heat ray projectors, as they could easily explain, in case they were arrested, that they were ignorant as to the purpose of the machines they were building.

"In short, he offered me a princely salary to find a mechanic and make these projectors for him. As you know, I have often wished for more money to carry on some expensive researches, and the proposition seemed to me to be an answer to my wish. Scruples of conscience? As to that, I feel no guilt. I am not committing a crime if I make those machines, and though I may help another to . . . well, I have long ago ceased to believe in eternal fires. Have I made it plain that I accepted?

"When Graves mentioned an electrical engineer, my mind leaped at once to you. Will you take this chance and become rich, or do you intend to stay in a rut all your life? I think I have made myself sufficiently clear as to our work, and if you accept, Jamison, you must write me at once. If you don't, I trust you to keep the contents of this letter entirely to yourself.

Very truly yours,
Your brother, Matthew."

## PART THREE (1941)

DURING the year 1940, the people of the United States had become suddenly aware for the first time that something more than the conventional, hide-in-the-dark bandit had established himself in their fair land. This revelation came as a complete surprise to them. Before April of that year the clergy and the law enforcement officers had been congratulating themselves on the success of their efforts to suppress criminality, for the number of crimes committed had rapidly diminished. The editor of more than one magazine of large circulation had ventured to comment on the increasing of the law-abiding spirit among the citizens; it was orated on by legislators, and the President devoted a goodly amount of space to it in his annual message to Congress. This advance, together with the increase of invention and knowledge, seemed to herald a new Golden Age of man. But the quiet was only the lull before the storm, the momentary pause before the cyclone.

John Merton Graves had devoted the winter months of that year to the organization and building up of his various forces. He rapidly trained good crooks to be better pilots; or, when this was not possible, he bought pilots outright from the numerous passenger and freight companies. He secured airplanes—the best, of types that had not yet been placed on the market. He slyly kidnapped Loren d'Antorut, the young French aircraft engineer, and as a result it was John Merton's planes that first appeared with the tiny helicopter vanes on the tip of each wing, a development of this same d'Antorut. He established a base in Amberton, somewhere in the hinterland of Illinois, and moved enough Chicago rum-runners and bootleggers to that little town to reduce the Windy City's crime record considerably. He spent millions in money, months in labor. And then, at the end of March, he finally looked over his work and pronounced it good. . . .

The first blow was struck on April second, when his ships, communicating by radio telephone, forced down the big *Toledo*, route-ship from Chicago to Detroit, and took twenty thousand dollars in gold from her. Two days later they met the *Edsel Ford*, which opened fire on them from automatic machine-guns mounted in her middle engine rooms. It was the opinion of watchers that the passenger ship might have won out, had not the big gasoline tanks, mounted in the wings, exploded from reasons unknown. Two hundred men, delegates to a business convention in Detroit, were either killed or fatally injured when the huge plane burst into myriad bits of duralumin. Not without creating a furor were some of the leading business men in the country wiped out.

Then rumors began to spread that a new weapon was being used by the bandits. Just how the rumors began is hard to say. Reports of farmers, at work near-by when the *Edsel Ford* crash occurred, stated that they had observed flashes of intense yellow light vomiting from the attacking planes. Undoubtedly the boasts of certain of Graves' gangsters had reached the ears of the police, and possibly these whispers had spread further than they were intended to. Be that as it may, the rumors did spread, and when a small cabin plane belonging to Associated Mining, fortunately carrying only pay-checks, was hailed by one of the bandits, the cabin plane took to earth at once, although it was a very fast ship. Its pilot made no attempt at resistance, for he realized that the checks would be worthless to the bandits. Moreover, he was consumed with curiosity as to whether or not the rumors of a strange weapon were true, and, while preparing for a landing, he formulated a plan to discover the truth. So he had hardly brought his machine to a halt before he set his stick a trifle back, opened the throttle wide, and plunged through the cabin door and to the ground. Then he lay behind a shrub and watched his stout ship speed unmanned across the sand and rise into the air as steadily as though a hand were upon the controls.

BUT the bandit plane appeared little disconcerted by this maneuver. Hawklike, it swooped down upon the slowly-climbing cabin plane, sending out long stabs of yellow light which slashed hither and thither about the helpless ship. The result—inevitable, as the man on the ground well knew—was that the latter's gasoline tanks blew up, and the plane, a hopeless, burning wreck, plunged earthward.

Some few moments after the bandit had disappeared in the distance, the pilot came out of his hiding place and walked over to the flaming ruin of his ship. With water from a near-by creek he succeeded in quenching what was left of the fire, and he managed to draw part of the wings and fuselage away from the main body. These he turned over and over again, until he found a tiny hole burned in one all-metal aileron, as if a red-hot poker had been thrust through it.

"This," he said to himself, "is not as it should be." Then he walked away toward the smoke of a farm chimney with a chaos of thoughts rioting in his brain: "Burned hole. How? Heat. How? Oxygen torch? No. Heat . . . heat . . . heat . . . By Gad! Then that's their weapon—a heat ray!

Well, by Gad!"

"And yet," he said aloud, "that doesn't mean anything. We know there's lightning, but that doesn't prevent it from hitting trees. . . ."

The young pilot was Anton Babel, Junior.

Three months went by, and the perils of the air grew daily. No one, from the billionaire in his palatial air yacht to the commoner out for an airing in his two-seater, was entirely free from danger. No one could foresee the next move of the air bandits; no one could guard his possessions so carefully that he could prevent them from being seized in the next swoop of those ruthless pirates. Police forces were doubled, tripled, quadrupled. But day by day it became more evident how far behind the times the officers of law enforcement were. Bandits flew circles around the slow police patrols; they amused themselves by dropping straight down onto police landing fields, and rising again, before their enemies' ships, unequipped with helicopter vanes, could gain flying speed. Police began to be afraid to open fire on the bandits, knowing that the retort would be swifter, more unerring, more deadly, than all the machine guns ever invented could send out. Many a patrolman, remembering that he had a wife and family, turned his back where he should have turned his revolver barrel; many a police commissioner forgot his duty, to think of his life. And the effects of this whole corrupt, cowardly system began to spread. A general deterioration was observed in public morals: dope-peddling, bootlegging, and prostitution gained, while the church and other beneficent institutions lost influence, fell off; lobbies and trusts began to appear in politics and business; crime and vice walked unrebuked in high places. . . .

## The New Pilot

IN the offices of the Middlewest Aircraft Corporation, Robert H. Crawford, superintendent in charge of transportation of that corporation, told his secretary to show in a young man who had just been taken on as a pilot. The young man took a seat in front of the tennis court of mahogany that Mr. Crawford called his desk.

"Humph!" said Mr. Crawford, who had read in some book that great executives talked like that.

"I agree with you," said the young man.

"Eh—what's that?" gasped Mr. Crawford.

"I said, did you want to see me?"

Mr. Crawford consulted a card on his desk, said "humph" again, and then condescended to talk with the young man.

"Yes," he said. "I did. Your name's Thompson? You came to us from California? Recommended?"

"Answering your questions in proper order," said the young man. "It is. I did. I was."

Mr. Crawford looked at his card again.

"Very well. You take the *Langley* to New Orleans this afternoon. Two o'clock."

"I do *what?*"

"I know," said Mr. Crawford, melting as much as his dignity would allow, "it really is—ah—hard on you. A new pilot, new route— But we haven't any choice. It's you or no one. Dinle got in two hours ago—tired out, says he won't take another ship out for a month. Beale and Watson absolutely refuse to fly over the well-known center of the whole bandit gang, and two other pilots are in the hospital. As I say, we have no choice."

"We-l-l-l, if that's it, far be it from me to object. I'll take her down to New Orleans, and regret that I've only one life to give to my corporation. You don't mind if I sleep till two? I can't get used to this Chicago noise at night, and I'm groggy right now."

"No—not at all," said Mr. Crawford, hastily. "Sleep all you wish. I'll have a taxi call for you at one-thirty."

"Until then," said Thompson, yawning in Mr. Craword's face. He threw himself down on the comfortable leather davenport in the waiting room, reflecting on the fact that he had fooled Crawford completely. When as Anton Babel he had been discharged following his desertion of the plane carrying the Associated Mining's pay checks, he had found it necessary to bury his past and get a new job, establishing his identity as "Carl Thompson." On the basis of this identity of "Carl Thompson—first class pilot" he now pillowed his head on a brief case, and was soon asleep. . . . Two hours later, by dint of much shaking and jerking, the driver of the taxi got him awake, bundled him into the cab, and drove him down to the airport in time to have him change to flying togs before two o'clock.

THE five-ton *Langley* left Chicago on schedule time, with a merry-eyed youth in the pilot's seat and fifty passengers in the cabin.

The trip to New Orleans had never been accounted a difficult one, for the region over which the route lay was well settled, and the broad Mississippi was nearly always in sight in case the compasses went wrong. But all this had changed with the establishment of the bandit headquarters at Amberton, which was well in the southwestern part of Illinois. Ships passing along the trail to New Orleans had been the most frequently robbed; in fact, it had become an afternoon's pastime for the bandits to stop passenger planes in order to replenish their pocket-money. Travel to New Orleans had become actually dangerous, and in consequence the number of paid fares had diminished. Whereas formerly three ships a day had been sent over the route, the number had now fallen to one, and that one was more than likely to carry a light load. People went to New Orleans only when necessary; and even the pilots began to complain of the danger to their lives.

Such was the situation that Anton Babel faced. He was a good pilot. Upon the death of his father he had refused the aid of condescending relatives, and had entered an aviation school. After two years of study and work he had graduated, had immediately found a position with a Los Angeles firm, and had been sent by it to the Middlewest when the two companies merged. He was now twenty-three, and as nearly happy as any man can be who has seen his father killed before his eyes. He had one love—for aviation; one aim in life—to find his father's murderer.

A half-hour out of Chicago he sighted Amberton. He knew the town by the numerous newspaper photographs that he, like all the rest of America, had seen. One might have thought, by the number of features and articles that had been written about the town, that the country was proud of it.

Anton rose to the "ceiling" of his plane—twenty thousand feet. He had no wish to be sighted from below.

Down on the ground "Slick" Nethers, a fine pilot and a man high in favor with John Merton Graves, looked at his wristwatch and cocked an ear inquiringly toward the north.

"That route-ship should be comin' over about now," he said, dropping his feet to the floor from the window sill where they had been resting. "Wonder if we scared 'em out—I don't hear it."

Lan Higby, interestedly scanning the beauties of a lady on a magazine cover, said out of the corner of his mouth, "Get the binocs."

Nethers removed the binoculars from a shelf, walked outside, and surveyed the northern sky.

"Got 'im," he said, with a smile; "he's way up! Must be carryin' somethin' valuable."

"Don't seem as though he would," said Higby, "he's certainly been stuck up enough. He may have, though. Les' go up and get him."

JOHN MERTON GRAVES, passing by the door, heard the last sentence. "What's this?" he asked, stopping.

Nethers explained. "Good," said the other, "I say—wait a second and I'll go up with you. It's confoundedly hot down

here."

They moved a plane from the hangar, clambered in and set it in motion. Once off the ground they shut down the helicopter vanes, turned on the tractor motor, and rose in great, sweeping circles. Five minutes brought them slightly behind and above the *Langley*. Graves opened their radio circuit and tapped out, "Land at once," the conventional opening threat of the air bandits. Anton, who, for the sake of comfort, had removed his radio headphones, did not hear the signal. The big ship drove steadily on.

Graves pressed a button on the instrument board of his plane. In the *Langley* Anton suddenly saw a vivid beam shoot once, twice, thrice across his line of vision. He started, and turned his head to the rear. Through the thick glass port-hole he saw a small plane hovering, saw again the thrust of that yellow beam.

Anton's blood raced in his veins. For one brief moment he pulled his throttle wide, and then, looking up, he saw a little placard pasted on the edge of the wind-shield glass. It read, succinctly, *"The Passenger Always Comes First."* Anton shut off power and put his ship into a glide. . . . He landed on a gently-rolling meadow.

After a moment the bandit plane floated down beside him. It swung around so that Anton could see the queer box-like apparatus under one wing; he noticed that it pointed directly toward himself. One of the bandits leaped to the earth and ran over to the *Langley*.

"Snap into it," he called crisply. "Everybody out. Line up here under the wing." He waved an automatic, suggestively.

The passengers, in various stages of fright and amusement, lined up quietly. Nethers went down the line. "Shell out." Wallets and pocket-books were handed over without question; now and then Nethers would see a ring or a dully gleaming necklace disappear, but a quick motion of his revolver was sufficient to bring the object to his hand. It was, on the whole, a rather dull and uninspired robbery.

Anton was the end man, and when Nethers came to him he handed him something very quickly. The other scowled at the object in his hand.

"What's this?" he asked.

"A nickel," said the pilot, coolly.

Nethers handed it back. "Keep it," he said.

With an airy gesture Anton waved the coin away. "Oh, no," he said, "does not the Good Book say, 'Give one-tenth of your fortune to the poor?' "

"Don't get fresh!" jerked Nethers. Then—"Where's the rest of the stuff?"

"This," remarked Anton, bowing, "is all."

## Recognized!

NETHERS scowled again, but he said nothing. He went over to the *Langley*, thrust his head inside the doorway and ran his eyes down the long rows of leather seats. But he saw no suspicious parcels, and so, after another prolonged scowl at the restless passengers, walked again to his own plane.

"That's all," he said, dumping an arm-load of assorted trinkets and money-containers on the runway. He clambered in after them. The bandit chief, changing to the pilot's chair, looked over at the *Langley* a moment before starting the engine. And then, as it happened, the sun was reflected from the shimmering tail-surface of the passenger plane in such a manner that it shone straight on the window of the bandit ship; and in that momentary glare the head of John Merton Graves seemed, to an onlooker, to be suspended alone in the air. And in that moment Anton Babel, turning to look once again at the robbers, saw a picture that was the duplicate of one that had met his eyes three years before! Only for an instant did the resemblance hold, but that instant left him weak and shaking.

Without an instant's hesitation he knew what he would do. He ran across the sward and caught the landing gear of the rising plane. Swinging his feet up, he twisted them around the trusses and supports; he gripped the axle of the two wheels with his strong fingers and hung on.

The wind howled in his ears, tore at his hair, slashed at his raw face with cruel claws time and again. The ground swam beneath him; the sky toppled and swayed above. He was sick, dizzy, breathless, dying! He saw mountains swing beneath him; forests leaped up and then a clearing. Then he saw buildings rushing to meet him; and the little plane, as lightly as a feather, came down on the landing field. Forward it rolled for a few yards—with the spinning wheels inches from Anton's face—until it came to rest in the darkness of the hangar.

Voices sounded, and he saw three pairs of flying boots strike the floor, one after another, and stride off. He dared not move. Greasy overalls came and pushed the plane farther on in a corner; finally dusk and quiet reigned.

He dropped to the floor and lay there, exhausted. At last he summoned strength to crawl out and stood weakly, clinging to the strut of an airplane, while he oriented himself.

The hangar was a place of shadows, out of which the edges of the giant doors showed as arched lines of white. A smaller arch marked a side door. Anton moved to it and opened it a trifle.

## Another Meeting

HE saw three hangars stretching away from him in a long line. They were strangely quiet. Not a motor sounded; only a few footfalls struck now and then, as mechanics went out of the buildings, locking doors behind them; the whole scene was buried in the deep quiet of a hot summer afternoon. Out of the corner of his eye he saw three figures enter a small house far to the left, and recognized one of them as the man who had held up the *Langley* five minutes—or was it, five years!—before.

Anton looked down at himself. He was dressed in the ordinary costume of the pilot: flying boots, moleskin riding breeches, white shirt, helmet—with the leather coat removed out of respect to the weather. A sudden impulse seized him; he stooped down, picked up a daub of grease, and smeared it lavishly on his shirt. He pulled down his helmet a little over his eyes, and stepped out into the sunshine.

It was even easier than he had thought. No one questioned him as he walked slowly past the edge of the hangar and into the yard. He met no one as he crossed over to the tiny house, strode up the steps, and entered the porch. There he halted, tense, as he heard voices proceeding from the door in front of him. . . .

. . . "But really, Graves," a cultured voice came out to the listener, "It's much more serious than you think. I'm sure I don't know what's become of the paper—it was sheer carelessness of us not to make copies of everything before this—but the fact is that it *is* gone. And it must be found."

"But why?" said another voice, curtly. "What's so important in it?"

The first voice went on patiently. "It's a formula, one of the few that Babel devised. It explains the casting of the mirror glass without which the whole ray-projector is useless. It has to be found. There's nothing else that can be of any avail."

"Come, come! Can't you copy the mirror glasses that you made for the first projectors?"

"No," said the other, firmly, "we must have that formula. I *know*."

Graves flung his hand down on the desk and swore fluently until the other broke in:

"For a leader of crime, Graves, you're singularly infantile! Profanity won't do any good."

"Well, then, what will? Can't you do anything? Gawd knows I'm paying you enough."

"I told you, it's being searched for all over the shop now. If human efforts can find it, we will. Just be patient—by the way, I brought over all the rest of his papers. Have copies made of them at once, will you? We certainly don't want anything like this to happen again. There are two other formulas here that are invaluable, and that couldn't be replaced if lost."

Anton heard the scrape of leather as a battered portfolio was pushed across the desk to Graves. He tiptoed nearer to the open doorway.

"All right, Winton," said John Merton, caustically. "But get busy and find that other paper, or it won't be so pleasant for you! Besides, you've been taking altogether too much of a high hand with me. Watch yourself, or I'll show you mighty quick where you get off!"

MATTHEW WINTON laughed. Then he looked at his companion with amazement, for John Merton had straightened up and was staring at something behind Winton's back.

"Say, where d'you think you are?" came from Grave's lips. "Didn't I tell you men not to get soused till Saturday? You know you're not supposed to come in here."

Swinging around in his chair, Winton saw a pale-faced, flaming-eyed man standing in the doorway. The man was looking straight at Graves, and there was neither respect nor apology in that look.

"I'm not drunk," said the man, "and I know very well where I am. I'm looking at a dirty murderer and a miserable, dastardly coward!"

John Merton leaped to his feet. "What the hell do you mean by that?"

"Just this. Three years ago you shot and killed an unarmed man, and robbed him afterward. Then you shot his son and thought you killed him. You didn't! I'm that son. My father was Anton Babel!"

Blue flame spurted from the desk, and Anton's cheek burned as the powder stung it. Then he had jumped to Winton, sent him staggering across the room, and shoved the desk hard into John Merton's stomach, as the latter fired again. He knew in that moment what he must do, and he vaulted over the wrecked furniture and fell compactly on the prostrate form of the master criminal. He felt the hard steel of the gun in his hand; jerked around and halted Winston's rush in mid-air. He caught up the brief-case that had fallen to the floor and backed swiftly away, squeezing with desperate abandon on the trigger. Bullets began to spray from the blunt end of the pistol and bore holes in the flimsy walls and floor. The door handle turned in his fingers and he was outside.

There were figures running all around him, and he turned the still spouting muzzle on them; watched them fade and vanish like mist before a wind. He was running himself before he knew it, running back and forth, wildly, like a trapped rat. Far off on the edge of the flying-field he caught sight of a plane standing with propeller turning idly, and he rushed blindly in that direction. Shouts arose; somewhere revolvers cracked, and lead smacked on the concrete all about him. But he was in the plane, and he raced the motor with a roar like the fabled Minotaur. Down the field, up, up, and still up! He was free!

Back in the ruined room, Graves had leaped to his feet the moment Anton was gone. He dragged Winton to his feet, shrieking madly, "He's got those papers!" and the two men stumbled out in the open air.

"Get a plane!" shouted Graves. "For God's sake get a plane! Don't let him get away! It's life and death to us!"

A new ship was hauled out of the hangar immediately, and Graves and Winton sprang into it. Again the beat of a motor was heard on the field, and again a plane took off. Watching the ship rise stood a motley mass of the bandits, and more than one of them shook his head uneasily.

## The Battle in the Clouds

WITH eyes on the compass and engine opened wide, Anton kept just below the level of the clouds and drove straight on. The reaction from those few exciting moments had come, and he laughed and sang as he listened to the steady "throb, throb," that was carrying him along. He felt calm, secure, safe. He patted the brief-case beside him in the seat; snuggled back into the soft comfort of his chair.

"Beastly luxurious blighters, those bandits," he murmured, laughing aloud again at the thought of their confusion, when—something yellow flashed past his propeller—flashed, and flashed once more.

He went into a side-slip, and dropped two thousand feet in a twinkling. Back he swung, leveled off, and looked up. Coming down on him, like a meteor gone mad, was a tiny ship, with the wind whistling through its struts and a yellow eye winking now and again under its left wing.

"This," he thought humorously, "is no place for me." And he went into an inside loop, came out of it, and began climbing. He was hanging on his propeller. He went higher and higher, and as he looked back he saw the other ship following relentlessly. Suddenly an idea occurred to him; he turned and ran his eyes over the instrument panel, stopping them when he saw, on the further end, a little white button. He pressed it; watched the air just ahead of his left wing. He knew then that he had not guessed wrong, for a yellow tinge seemed to envelop the ship!

Then it was battle of pilot against master pilot—of the hunted against the hunter. Back and forth the two flashed across the sky, going higher and higher with each change of direction, till they were alone in the cold vastness, many thousands of feet above the ground.

Yellow ray against yellow ray—skill against skill!

Neither thought of retreat as they turned and twisted. Once Graves' heat ray caught Anton's ship just behind the cabin, and only the distance that separated them and the almost superhuman quickness of Anton saved him. Anton himself, after a few thrusts with his ray, used it no more, but devoted all his time to his controls. And the wisdom of his tactics began to show. In every maneuver he gained ground on the other, in every sweeping circle he drew nearer to his objective. Graves fought valiantly, but he could not prevent the inevitable; and at last Anton secured the position he was aiming for, over and far behind the bandit. Here John Merton could not reach him with his heat ray, and Anton, knowing it, swooped down in a swift, merciless curve. A golden, dazzling beam came from the under side of his wing; it caught the other ship in a cruel halo of radiance. . . .

And then, only Anton flew the higher skies—alone, watching with set eyes a thing of flames that staggered crazily, end over end, down and still down, till he could see it no longer! John Merton Graves had lost for the first time—and for the last.

BEHIND the falling plane, after a moment, came Anton. He followed it in its wild career up to the time it dashed to earth; then he switched on his helicopters and landed not far from the burning wreck. He got out and stood for a while on the soft green grass, watching the flames. The two ships had come down in a small dell, hedged in on either side by magnificent trees, its interior carpeted with the most vivid of grasses, while a spring flowed from the tiny knoll in the middle. The roaring holocaust near one fringe of trees was in terrible contrast to the peaceful beauty of the surrounding scene. One would have declared that the anger of man could never have penetrated into this quiet vale. The flowers and the fernery seemed to stand aghast at such intrusion!

Reaching into the inside of his cabin, Anton took out the portfolio. Then, sitting there on the grass, he read, page after page, the diary and the records of his dead father. Some

(*Continued on page* 942)

# The Flying BUZZSAW

By Harold B. McKay

(*Illustration by Paul*)

**I shot through the dirigible as though it had been of paper. The gas bag buckled in the center while from a jagged hole protruded mangled girders.**

# THE FLYING BUZZ-SAW

## *By the Author of "Flannelcake's Invention"*

WHAT a weapon it would make! What an engine of death and destruction could be evolved from so simple a machine! It would be invincible.

It was a circular saw that was the subject of my idle musings one day as I worked in the woodwork shop of the Contra Costa Aircraft Company. The cabinet and carpenter work were not exactly new to me, but for some reason the sight of a buzz-saw always held me fascinated. The almost silent spinning blade, so innocent looking, but how vicious! I emphasized this latter thought by shoving the large spruce plank I held full against the saw. With a resonant whang the board was neatly cleft. What a machine!

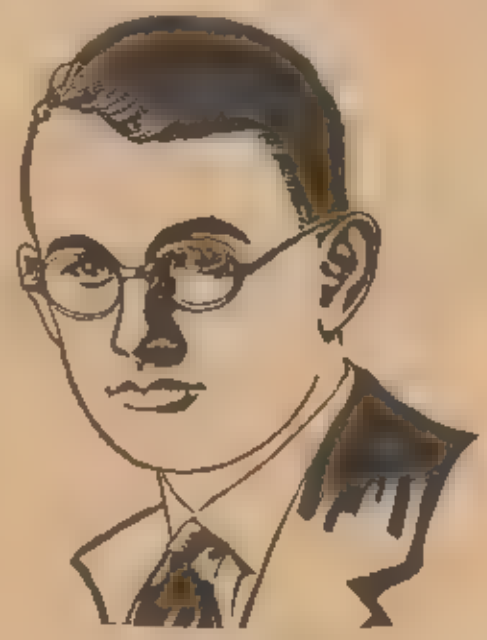
And then it happened. For no reason at all, a piece of the severed board dropped over the rear of the table and fell on the ten centimeter belt that operated the saw. When the block hit the pulley, there was a terrific jerk on the saw table; it was wrenched from its floor moorings and toppled over on its side. Something that it struck broke the saw from its shaft and the great blade flew out into the air horizontally. It described a gradual upward curve, cutting a lamp cord on the way and then suddenly boomeranged and started back. Before I knew what had happened the spinning saw had gashed deeply into my thigh. The sight of the red, gushing blood made me weak; a nausea crept over me—then dizziness. A galaxy of universes swept about me, planets rotating about in their own little systems. . . . I seemed to be traveling in time itself, onwards. . . .

* * * *

I was again at work in the aircraft factory; but with the feverish haste of wartime activity. War! The Consolidated States of North America, which included the entire continent, were faced in this summer of 2014 with an enemy on their very doorstep. The combined military forces of the continent of South America, under the asserted influence of Japan, were struggling with the North American forces in a grim battle for supremacy. On the narrow frontier of the Isthmus of Panama the land forces of the great nations had desperately locked horns. And already had the "Southern" planes made long reaching skirmishes over the "Northern" territory, taking a deadly toll. The Northern forces were seriously handicapped by a lack of fighting planes, having only a hastily equipped fleet of former pleasure craft, befitting a nation of great wealth. That this continent would always be the last to progress in the art of devising scientific and technical weapons of war seemed evident. From the first day the white race reached the Northern American shores, its means of defense against inevitable enemies had always been deficient. But for some reason, perhaps luck, or was it fate, it had always come out on top.

It seemed as if the characteristic luck might be with us again, and in a spectacular fashion, if a certain Dr. Bloomsworthy had anything to say about it, for he was constructing, in the shop of which I had charge, a type of aircraft unrivalled in fact or fiction. The Doctor was a scientist with a peculiar mechanical genius, and it was this genius that was guiding the construction of the monstrosity on which I worked.

In an immense camouflaged shed in Lower California, a dozen huge machines were being built. Intense secrecy surrounded the assembling, and few men were employed. The individual parts had been made in many scattered factories throughout the country. In fact the first machines had been built with private capital, the government having considered Bloomsworthy a maniac. The machines resembled huge discs, forty meters* across; they were perhaps more like wheels, having vanes, like fan blades, instead of spokes. These blades were movable, and, when they were horizontal with the rim, made the machine appear to be a solid disk. In the center of the disc, projecting on either side, was the cabin or control room in the shape of two truncated cones with their base on the disc. They were about six meters across and extended somewhat less than that, on each side, from the disc. The machine looked much like a great thin wheel with a thick hub.



HAROLD McKAY

I WAS at work supervising particularly the completion of the control cabins and it was understood that I was to pilot one of the machines in the primary maneuvers in the field. The project was rushed to completion, for already the "big drive" was on. Our frontier was being pushed back daily, while the enemy air forces spread terror in cities far behind the lines. Our brave fliers were going bravely to their deaths in the aerial skirmishes; for they were hopelessly outnumbered.

It is surprising that the general construction of aircraft has not changed in nearly a hundred years. Though the planes used were almost fantastic in their inner construction, they were still worked on the same old principle: an inefficient propeller beating against the air, striving to force an awkward plane into graceful flight. A fight in the air still meant no more than a fight on the ground; just a question of numbers, strategy and endurance.

The day of trial for Dr. Bloomsworthy's great machines was at hand. Each machine was rigidly constructed of steel throughout. There was no evidence of frail, flimsy parts so characteristic of the usual airplane. But our ship was a destroyer of the air, a killer. Driven by powerful internal combustion motors, they were stabilized by two great gyroscopes in an equatorial mounting. The gyroscopes operated from small electric motors run by auxiliary batteries so that in event of failure of the engine, a safe landing could be made. The vanes in the discs were mounted on steel rods and arranged so that they could be opened or closed.

The control cabin was built with simplicity throughout. Below the disc, in the truncated cone room, was most of the operating machinery. The roof of this engine room was the floor of the control cabin, and was situated below the disc. A con-

*THERE seem to be, at the present time, two contrary trends in the development of aviation, particularly for warfare. One is toward the light, swift plane with a maximum of maneuverability, and the other is toward the heavy combat plane that carries a maximum of heavy guns, bombs and other offensive means of warfare.*

*There is no doubt that ingenious and technical science will devise newer and stranger combat weapons of the air and in fact, there is practically no limit to the forms that such a plane and its equipment may take.*

*We are sure our readers will agree that what Mr. McKay's ingenious brain has devised, is something which has not yet been thought of. And all those who have seen the devastating effect of a buzz-saw in operation, will agree that he has invented something which will be extremely practical, and almost invincible.*

* 130 feet.

tinuous window of bullet-proof glass surrounded the cabins on either side of the disc. It was thus possible to see in almost any direction from the control room. Due to the machinery necessary for handling the operation of the vanes, the cabin was small, not two meters* across, and it was surrounded within by a continuous circular seat, so that the pilot had but to slide around to face in any direction. This was necessary because the hub of the machine was prevented from turning by gyroscopes, so that when the craft took to a different direction, the pilot had to move.

The control method was simple; a handle, like the gear shift of an ancient automobile was set in the middle of the floor; on it was a ball that could be slid up or down. The machine was designed to move in whatever direction the handle was pushed on its universal joint, while moving the ball caused the giant wheel to rise or fall vertically. All movement like this was to be done in one plane, the direction being determined by the way the vanes were opened.

A pillar projected from the ceiling almost down to the "gear-shift" handle, and a few levers mounted on this controlled such auxiliary functions as releasing the main motor clutch, banking the disc by bearing on the gyroscopes.

Perhaps the most startling function of one of these levers was to cause a number of great steel teeth to appear at the edge of the disc. The teeth were to be the fighting claws of this, the *Flying Buzz-saw*. Trials proved the machines to be great successes, and in spite of the seeming bulk of the things, their efficient means of propulsion caused them to be highly successful and there was no wasted wing-space: every inch of those great vanes was active.

* * * * *

## First Encounters

IT was on the first day of December, 2014, that Dr. Bloomworthy's fleet of privateers took to the air. Each machine was manned by a pilot and a mechanic, and carried no guns. Before the departure, the doctor addressed his detachment of some two dozen men.

"Gentlemen, I need not stress the importance of your present duty, for you are aware of that; I need only urge you to be merciless; remember, our success depends on a concerted, reckless drive. You must literally slaughter your enemy; show no mercy; have no conscience; it is them—or you. Now then, up and at them."

That morning there arose a fleet of the weirdest engines that had ever been devised. As they rose from the ground they must have looked like great needle-bugs, with the edge of the thin disc as the outspread wings. I was at the controls of the first ship in our little formation. As I cleared the ground with the disc of course horizontal, I altered the blade pitch for vertical speed. Acceleration was accomplished only by turning the vanes, the motor being governed at even speed. At the three thousand-meter level I shoved the control stick south. My acceleration meter, an ingenious spring and weight device, went to the end of the scale. This meter was quite essential in manning the craft, for by means of it we could tell just what we could do in a maneuver, as well as the direction of our motion, and whether we were freely falling, or driving down. My speedometer steadily mounted, till at the 500-kilometer mark, it hovered, and my acceleration registered zero. I decreased the angle of the vanes to cut down air resistance, and increase speed. At different speeds the vanes must be altered just as the engineer moves the "links" on a steam train. Again my acceleration showed positive, and before long we had reached the thousand-kilometer mark.

The great discs cut through the upper air like large tin can covers. Their own natural gyroscopic effect made them immune to transverse winds and air pockets. They were invincible!

After an hour or two we were over the frontier and in the center of Mexico. We had hoped, for a first encounter, to meet up with large bombers or the like, but over the field we found only a myriad of small planes, terrorizing our infantry with machine gun fire. At higher levels several skirmishes were in progress between individuals of both forces. We dropped down to try our luck at scattering the lower bunch, and were surprised in the act by a squadron of the enemy battle planes that approached from the east.

Their first move was to circle about us, as if to determine our excuse for existence; perhaps they were awed by our peculiar appearance.

BY this time we were hanging motionless over the trenches not 500 meters up. Though our squads could communicate by radiophone, it was generally understood that in battle we would act on our own. With a sudden decision, I looked for a victim. A hundred meters above me a monoplane rounded into a bank; I pulled the ball to the top of the stick and my great ship rose like a hydraulic elevator. As I reached my opponent's level, he nosed over to drop, and as he passed, a harmless rattle of machine gun fire sounded on the slanting sides of my cabin.

The battle was on! I shoved the ball down, and there was a shudder of the machine, as its motion reversed and the vanes turned for downward flight. My first hit was more accident than skill, for as my opponent rounded out of his dive, he found that I had dropped to a position squarely in front of him. I saw the great nose of the monoplane head straight for the vicious teeth of my giant wheel, and a second later there was the screech of rending metal, and his big motor was ripped from the plane and tossed into space. The plane was severed laterally from tip to tail, and the debris flung fiercely from the disc. It must have been a terrible death for my enemy. But fighters soon become hardened to anything.

The others of our squad had done equally well, and soon the air was filled with shattered craft dashing crazily to earth. The lust for blood was creeping on me; a morbid glory in slaughter; I must get bigger game! No sooner said than done; far above and to the northwest appeared a squad of giant bombers of the Excelsior type, apparently returned from the shelling of some Northern city. I strained the controls to reach them, and soon was on their level. Several of my comrades followed, while the remainder took to aiding the Northerners in the "duets" above. The Excelsiors were not to be taken unawares, however, for, try as we might, we could not get them in line with our "teeth." A chance hit was scored, though, when one bomber, in banking, lost a wing to our cause, and subsequently slid out of the fight.

It was time to try a new type of maneuver. I withdrew about a kilometer, and then charged forward. As I reached a speed of 300 kilometers per hour, I disengaged the motor clutch; and then pulled back the stick to reverse. As the disc was merely idling, the reverse wind resistance stopped it quickly, without checking my headlong flight. When the disc is stationary, its natural gyroscopic effect is neutral, so that it can be banked, that is, the plane of flight is changed by rotating the whole machine about the internal gyroscopes. I turned the big wheel vertical and then threw the vanes wide open to climb. Inasmuch as the machine was vertical in the air, climbing was then done by pulling the stick "up" in reference to the earth, instead of using the ball. Traveling in this fashion calls for skill, because the power of the motor must sustain the disc, no wing surface being effective against falling. Climbing would have been slow this way but for my running start. I charged upwards to the stomachs of the great Excelsiors. Several gunners peppered me with their light aircraft artillery. My answer was to laugh.

I was beginning to feel the glow of battle, the warm blood pumped madly through my veins.

* 6½ feet.

## The Big Push

I QUICKLY worked levers and stick, making my ship flit crazily in every direction to confuse the pilots of the bombers. I was successful—two of the bombers collided trying to avoid me, and went down in flames. And then, in a strategic point, "I gave her the gun." Ri-i-i-pp Crash! Three planes, in quick succession, felt the cold, sharp steel and like lumps of butter were neatly sheared in two. A big motor of one plane struck one of my teeth, and I was obliged to temporarily withdraw them to prevent my machine from shaking out of equilibrium. Looking around at that moment I saw that others of my fleet had brought down the rest of the bombers, and now, to my surprise, not a single one of the enemy was left in the air. All those that had not been forced down had fled in terror. We were masters of the air! The victors! The sense of triumph was intoxicating; we had not suffered a single casualty.

We knew, however, that it was but temporary; soon the enemy with his almost limitless forces would retaliate, blow for blow.

After some communication by radiophone we decided to reconnoitre for a while. We had, for the time being, given the enemy something to think about. Some hours later, while on the way back to our sheds, we met a small scout plane of the Northern Army, who radioed to us that we were to report to the Commander-in-chief of the Northern forces. Accordingly, we picked up Dr. Bloomsworthy at our shops, and then, with three others of our fleet, reported to the War Office in Denver.

After explaining briefly the operation of his ship, Dr. Bloomsworthy offered to work with the Air Forces in a concerted "big push" on the morrow. Obviously, it was too late to start the construction of more of the ships, so it would be necessary to fight with the few machines we had and those that were being rushed to completion. After a conference that lasted far into the night, we retired to our sheds, and after a short rest prepared for active service the next day. We were to carry bombs, so that we could make ourselves troublesome to the ground forces of the enemy also.

At ten o'clock the next morning, word came through the government lookouts that the enemy was mobilizing a great air fleet; possibly with the idea of crushing us by sheer numbers. We took to the air with the spirit of battle in every man, aye, even our great engines seemed to thrill to the impending struggle! A half hour out, and we were met with a fleet that fairly filled the horizon before us. It composed the bulk of the Northern air forces, just sent out from Vera Cruz. They were all fast ships, and joining them at a thousand kilometers an hour, we were soon sighting the enemy.

Although the Northern fleet had impressed me as being big, it seemed puny when I viewed the enemy fleet that rode out to meet us. Their craft fairly blackened the sky. Hundreds of bombers and many huge dirigibles stood out against an almost solid background of smaller planes. Even with the discs, our chances looked slim, for we must have been outnumbered ten to one.

How serene the two vast fleets looked as they flew towards each other; it impressed me as being like two trains unwittingly rushing toward each other on a single track. Speeding serenely on—to destruction. Every man in our army must have been as tense and silent as were the knights of old, riding their steeds to fatal tournaments.

IN a few agonizing minutes the battles were on. Like two swarms of locusts flying through space, the rival fleets clashed to practically melt together in the heat of a great conflict. Fighting with our ships was comparatively easy. In maniacal frenzy we dashed in every direction, leaving twisted wrecks behind. The Northern scout planes skipped around mosquito fashion, on the edge of the war zone, getting all enemy planes that tried to maneuver out of the mess. After a time my lust subsided; I was jaded from the thrill of the vibration of my giant buzz-saw as it tore engine from plane—muscles from body. I grew suddenly weary—and then, I saw a plum in the pudding.

The huge hulk of a Zeppelin hove before me. Again a lust—a greed—a passion for destruction filled me. Such a prize! I drew quickly up and described a long boomerang arc. I mentally calculated the motion of the dirigible and then tore madly downward leaning about forty degrees out of the vertical. My speed was reckless, but my aim was perfect. A quick glance showed my acceleration to be that of gravity, my speed five hundred kilometers an hour! and then zip!—I shot through the dirigible as though it had been paper. As I slugged the controls to check my precipitous fall, I stole a glance back at the giant gas-bag. It had buckled in the center and was slowly falling, while from a jagged hole in its middle protruded mangled girders. I climbed for a period, and then, with all the force I could use in an uphill climb, I plunged into the bag from the bottom. As I was obliged to close the vanes when cutting through anything, my ship stopped its upward flight in the entrails of the dirigible. The saw teeth were still working, however, and I was at a height of morbid enjoyment. There, floundering around in the dark, only the heavy throbs of my cabin told me of the girders that were being wrecked.

Soon I saw light again, for the great ship had broken in two, and I dropped some distance until I could again get my vanes to work. Just as I checked my flight, I noticed that the enemy were again in full retreat, scampering southward with a flock of relentless buzz-saws chasing them, cutting into them as they went.

At this moment, part of the nose of the Zeppelin, with a single immense cabin attached, floated down toward me from above, a great parachute open above it. It seemed as though it were about to drop on top of me, and as I looked, I saw two of the crew, alive, in the cabin. I had a bloodthirsty desire to cut through them as they slowly slid past. But to all things an end must come for they were not a hundred meters away when they both opened fire with a ten centimeter artillery piece that was left in their doomed cabin. One of the heavy shots struck full in the machinery room of my ship, another ripped out several of the vanes in my wheel. My ship described a dizzy eccentric helix, and floundered earthward. Of a sudden the damaged gyroscopes below me tore from their bearings, and the body of my mechanic ripped through the steel floor. The cabin, without the gyro control, assumed the motion of the disc, and soon the centrifugal force held me fast against the wall. The earth rushed up at sickening speed. I was going to hell with no brakes! An hysteria came over me, consciousness vanished and returned as though a myriad of tiny stars flew past as I fell. Time was fleeing, my ears were filled with the drone of ever-changing harmonics. Then came a terrific crash. I had landed—on the wooden floor of the aircraft carpenter shop. Some one was tightening a bandage to my side. And I heard as from a distance a voice that said: "I wonder what he means, 'Did we win the war?'"

THE END.

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# EVANS of the EARTH GUARD

## *by Edmond Hamilton*

*(Illustration by Winter)*

**The grim black rocket, whirling and diving with an astounding swiftness, was endeavoring to bring the twisting little craft into the lines of its guns.**

# EVANS OF THE EARTH-GUARD

## *By the Author of "The Space Visitors," "Cities in the Air," etc.*

ALL Earth-Guard rockets attention! One-man rocket *Pallas* speaking. Am pursued by pirate rocket believed to be that of the Hawk! I am running toward earth on space-lane 18, now in zone 44-6, but am being rapidly overtaken!"

As the clear voice came from the radiophone before him, Captain Wright Evans slammed over the reply-switch and shouted back into it.

"Earth-Guard Rocket 283 answering. Standing toward you at top speed instantly!"

Then he was up and bursting into the great rocket ship's squat little pilot-house, where a man seated at the controls turned inquiringly to him.

"Full speed ahead, Calden!" he cried. "The Hawk's out again and after a one-man rocket not a thousand miles ahead—it's our chance to get him at last!"

"Full speed it is," rejoined Calden calmly, his hands flashing forth to flick down a half-score of the banked shining levers before him.

Instantly the great ship lurched and trembled as, from its rear, came thunderous explosion on explosion. In a moment every one of its rear-tubes was firing, and the speed-dial's arrow was creeping steadily forward until in a few minutes more it registered the ship's top speed of ten thousand miles an hour. The long gleaming craft, stubby of nose and stern and fully five hundred feet in length, was like a giant projectile, as it tore through the void, belching fire behind it.

From the squat pilot-house set atop it, Evans and Calden gazed ahead. The great gray disk of earth filled a quarter of the heavens before them, the outline of its continents and seas visible here and there through its shifting screen of clouds. Behind them the moon's silvery sphere was dwindling rapidly, as they had seen it dwindle now for hours. It was hours that the great Earth-Guard rocket with its half-hundred men had been hurtling toward earth after its weary week's vigil in space, before this call had come.

And weary enough indeed was the vigil that the rocket ships of the Earth-Guard kept around the earth and its moon, and had kept up for more than fifty years. More than fifty years it had been since, back in 1954, the first crude rocket had thundered out from earth into the great void toward its shining satellite. Neither that first rocket nor the twenty-first had reached their goal, but the next one had.

Thus had begun the commerce that now filled all the space-lanes between the earth and moon. In their first flame of exploration, men had headed out toward the nearer planets, too, but they had found them unapproachable because of the fierce guard maintained by their strange peoples. Every ship that had sought to explore another planet had been annihilated on reaching it and we had finally realized that our planetary neighbors were guarding fiercely their isolation.

THERE had remained to earth only its own moon. But that had become swiftly a lure to all adventurous earth-lings. Upon the moon's other side were great mines in which men, dwelling in air-tight cities and toiling in hermetically-tight metal suits, worked the rare metals and minerals in which earth's satellite abounded. And upon the moon's earthward side were other great air-tight cities, glass-roofed and luxurious, to which went each year hundreds of thousands of the earth's wealthy—there to spend their vacations—enjoying the wondrous celestial views, the astounding strength and youth given them by the moon's lesser gravity, and the chance to view the earth from the outside.

EDMOND HAMILTON

*THE present likelihood is that the first interplanetary flight will probably be by mean of a rocket-propelled ship. As far as our knowledge goes the rocket seems to be the most feasible means of propulsion because it will reach its greatest efficiency in the vacuum of inter-stellar space.*

*If the conditions on other planets, including our moon, are not too prohibitive, it is doubtless true that these planets will be explored for whatever mineral wealth or possibilities of life they may contain. The resulting interplanetary commerce will call into being a host of problems, such as the protection of cargo and passenger shipments against natural and human agents that might wish to destroy them.*

*In that case, the Earth-Guard that Mr. Hamilton describes so vividly will play a most important part in the protection of such commerce.*

*Mr. Hamilton, as is usual with him, has, in this story, developed it so that we were unable to predict from page to page what would happen next. And the editors were just as fooled by the surprising denouement as we believe our readers will be.*

So that there had grown gradually the commerce that kept endless streams of ships moving between earth and moon—great and luxurious passenger-craft laden with the wealthy and powerful of earth; and sleek private ships bound like the others for the luxurious lunar cities. Bulky and battered cargo-rockets had their own space-lanes, carrying metals and minerals to the earth, and returning with loads of supplies and tanks of the liquid rocket-fuel to the moon.

It was inevitable that all this traffic should need regulating, and so there had been formed the Earth-Guard, an organization corresponding to the old Coast-Guards of the nations, but controlled by an international commission of earth's powers. The Earth-Guard boasted five hundred gleaming rockets that patrolled ceaselessly the space between and around the earth and moon, enforcing peace with their electric guns and guarding the lunar commerce.

For there were those against whom it must be guarded—space-pirates who dashed forth from time to time from hidden bases on earth or moon to harry and hold up in the void the rich lunar commerce. The boldest and most dreaded of them all was that swift and flashing corsair of the void known to all on earth and moon alike as the Hawk, and who for years had been the despair of all the Earth-Guard.

"Lord, if we can get him!" Evans was praying as he gazed out of a port hole from the hurtling ship's pilot-house. "I get so tired of jabs about him that I'd lose an arm to get him."

"Well, everyone's turn comes sooner or later in that game," philosophized Calden. "It may be the Hawk's now."

Evans pulled a speaking-tube toward him and shouted down into it over the roar of the rocket's explosions. "Hartley?

Put full crews on all the electric guns and have them stand ready for action. Yes. And tell them it's the Hawk we're after this time—it'll put them on their toes."

Calden grinned as a moment later a muffled cheer came up from the gun-rooms beneath. "They're on their toes, evidently," he commented. "They're as crazy to get their hands on the Hawk as you are."

Evans made no answer but started ahead with teeth clenched upon his lower lip, glancing over now and then at the dials that recorded the rocket's position between earth and moon. This recording was automatic, being dependent on the change in the gravitational power of the two bodies. Evans saw by them now that the rocket was hurtling into the very zone in which the *Pallas* had reported itself.

## Missed!

HE reached to turn a knob and there clicked up into position against the lenses set in the pilot-house window two long metal tubes with eye-pieces that formed powerful binoculars. Gazing ahead through these he kept watch, while with fingers on the firing-levers of the rocket's tubes Calden kept them steady on their course. Minutes passed before Evans uttered a cry.

"They're just ahead!" he exclaimed. Then, into the tube—"All batteries ready, Hartley, and use the port guns when we bank."

"Lord, look at that fellow!" breathed Calden as he too stared ahead. "He sure can handle a rocket—the Hawk can't get his guns on him!"

Far ahead of them in the void the scene of combat to which they had been summoned was rushing into view. A tiny and shining one-man rocket was dodging and twisting and circling in space, with its firing-tubes flaming first on one end and then on the other to keep it in an ever-changing course. And around it, like a great grim pike rushing a shining chub, was circling and swooping a long dead-black rocket of the same size almost as the Earth-Guard craft. It was the dreaded black rocket of the Hawk, reputed the swiftest craft in space.

The grim black rocket, whirling and dipping with a swiftness of maneuver astounding in a ship of its size, was endeavoring to bring the twisting little craft that evaded it into the line of its guns. As their own ship thundered down on the scene, Evans and Calden saw the one side of the Hawk's rocket stabbing forth a half-score slender jets of blue fire as its electric-guns blasted toward the smaller craft. But the latter had shot upward in time to avoid the fire, and in the next moment the Earth-Guard rocket was rushing down upon the ebon attacker.

"Fire!" As Hartley's voice below shouted the order, the Earth-Guard ship poured a deadly fire toward the black rocket of the Hawk. But at the very instant of firing, with a swiftness born of a hundred space-fights, the Hawk's rocket had shot upward.

"Missed him!" Calden cried. "Look out—he's tailing—!"

"Over quick!" Evans exclaimed. "Let him have the stern guns, Hartley!"

For in the instant after shooting upward to avoid their fire, the rocket of the Hawk had flashed back down on them in the familiar maneuver of "tailing," using all the firing-tubes placed in its nose for braking purposes to halt it and reverse it in a flash.

Evans had a lightning glimpse of the great black shape rushing stern-foremost down on them. Then he felt his own rocket dip and dive like light as Calden's hands flashed on the firing-levers, and for a moment Evans saw the white-lit pilot-house of the other rocket, with the tense figures inside it, before it whirled out of view. He sensed rather than saw the blast of the Hawk's guns above them as they dived just in time to avoid the deadly missiles.

EVANS heard shouting voices from their own gun-rooms and had no need to cry to Calden the next order, for already the other was straightening out their course and sending their ship soaring upward again. But the long black craft of the Hawk was gone! After that one swift swoop and blow it had flashed off the space-lane into the uncharted void, and they glimpsed it only as a dwindling point of fire, that vanished in the next instant.

Evans, filled by a blind fury, whirled to give Calden the order that would send them in wild pursuit, but checked himself as he realized, despite his rage, the futility of such a pursuit. Once out of sight, the Hawk in his immensely swift rocket could laugh at all pursuit, as he had laughed many times. His face a study of conflicting emotions, Evans turned back toward his second-officer.

"Back to our regular course on the space-lane," he ordered wearily. "He's got away again."

Silently Calden headed the great Earth-Guard rocket again toward the great disk of earth. But in a moment he motioned toward something outside and above them. "It's the rocket the Hawk was attacking," he said. "He's signalling for a contact."

"Let him come on, then," answered the other.

Calden pressed the studs that flashed from their own rocket's nose the answering colored signal-lights, and quickly the shining smaller craft drove down until it hung just over the big Earth-Guard ship. It settled smoothly then on the greater craft's back, its nose firing-tubes blasting it to a halt. The ring of metal contact-pins on its lower side fitted smoothly into the standardized ring of openings ready for them on the Earth-Guard's back.

Held thus to the greater craft, the little rocket was carried along through space like a pilot-fish clinging to a great shark. In a moment there was the clang of the contact-door opening, as the occupant of the *Pallas* passed into the Earth-Guard rocket through the latter's similar door. In a moment more Hartley, the third officer, was striding into the pilot-house with the man who had been the little craft's sole occupant.

He was a tall young man with dark hair and dark, laughing eyes. He came forward with hand outstretched to Evans and as the rocket-captain grasped it, he introduced himself.

"Francis Seaworth," he named himself, "and just now mighty pleased to see you! Indeed, if you hadn't come when you did, the Hawk would have had me in another minute—I didn't have anyone to work my gun and could only try to evade him till you came."

Evans laughed. "What in the devil made you start for earth all by yourself?" he demanded. "Didn't you hear two days ago that the Hawk was out?"

The other shook his head. "I heard," he said, "but that's just why I chose this particular time for the trip. No, I don't mean that as bravado," he added quickly, as he saw the incredulous smiles of the three officers. "What I mean is that I knew the Hawk was waiting for a chance to jump on me, and when I heard he was out on the space-lanes again, I thought he'd be too busy at his usual trade to think of me."

Evans regarded him with more interest. "But what's the Hawk after you for?" he asked.

Seaworth hesitated. "Well, I wouldn't want to spill too much." He nodded toward the other officers.

Evans straightened with interest. "Anything you want to say you can tell me in front of my officers."

"Well," said Seaworth, "I've been spending the last year as a secret agent of the International Commission, looking for the Hawk's base on the moon. They had an idea—just an idea—that the Hawk's base was really inside one of the lunar cities."

## Seaworth Explains

"IN a lunar city?" Evans repeated. "Whoever got that idea?"

Seaworth shook his head. "It seemed crazy to me at first too, but there were rumors that officials in one of the lunar cities were allowing the Hawk to come there, and to refuel in exchange for a share of his loot. I was sent up to investigate, and I found out enough to call the Hawk's attention to me, and this is the second time he or his men nearly got me. I couldn't find his base, but I did find that there's a man now on earth who was formerly in his service and who could tell me where his base is if he wanted to. So I started back to earth in my own ship to see him. Well, the Hawk was waiting, and if you hadn't been within call it would have been all up with me."

Evans considered. "It did seem mighty queer to us that the Hawk would stoop to holding up one-man rockets," he admitted, "but that explains it. So they've had a secret agent on his trail, eh?"

"A very secret agent," smiled the other. "My emblem," he smiled as he opened his jacket and showed a little card sewed onto the inside.

Evans nodded. The card of an agent of the International Commission merited any help he could furnish.

"In fact," continued Seaworth, "I doubt if a dozen men on earth outside of the International Commission know what I've been doing. I've got no business, really, telling even you about it, but it's about all wound up now, for if I get the information I'm after on earth it means we'll catch the Hawk in short order."

"Seems like catching the Hawk is work for the Earth-Guard rather than for any secret agents," growled the bulldog-visaged Hartley. "We're good enough to chase after all the common scum of space-pirates that are always bobbing up, but when it comes to nabbing the Hawk someone else wants the glory."

"The glory's been there for the Earth-Guard to take for some time," retorted Seaworth acidly. "I haven't seen it doing it, though."

Hartley's face went dull red, and Evans intervened in time. "No use scrapping over it," he told them. "Anything that Seaworth finds out will help us, and I for one don't give a continental who catches the Hawk so long as he's caught. Every time I go into a teletheater nowadays, all I hear is a lot of musty old cracks about the Hawk and the Earth-Guard, and I don't mind telling you I'm getting tired of it."

Seaworth laughed. "Well, it was nearly a case of the catcher caught with me this time. I suppose I don't need to tell you that I'd rather make the rest of the trip with you?"

Evans nodded. "Of course. Though as a matter of fact the Hawk's probably ten zones off by now. That's always his way—he swoops and strikes and flashes off before anyone can get hands on him."

"Yes," said Seaworth, his eyes troubled, "but he happens to want me devilish bad, you see. I'll admit I'm not going to have much taste for the trip back to the moon—I wouldn't put it past him to hold up the biggest passenger-ship in space if he knew I was travelling on it."

"I wouldn't myself," Evans said. "But we're heading back next week after our relief-period. Why not go back with us?"

Seaworth's face cleared. "Thanks a lot, really, old man. It's a fact I've been worried about this trip back, for if I get what I'm after on earth, it means that when I get back to the moon we can find the Hawk's base and make a trap of it to catch him when he comes in. And I want to see him put away before I check out—it's got to be something of a personal duel between us."

In the next half-score of hours in which they hurtled on toward earth, Evans saw that Seaworth was indeed getting more and more impatient and eager as the great disk grew large before them. He fretted at the delay as they moved in through earth's atmosphere at slackening speed, and down through the crowded converging space-lanes toward the huge New York inter-stellar station. And when the great Earth-Guard ship shot down into the funnel-shaped landing-framework and came to a halt with all its nose-tubes firing, Seaworth emerged from it with its first officers.

BRIEFLY he assured himself once more that Evans was willing for him to make the trip back out to the moon in the Earth-Guard craft in the following week, and he also made certain that his own little rocket could remain attached to the greater craft and be refueled with it. Then he hastened away in the crowds that poured here and there across and around the great rocket-station.

Evans stood still for a few moments gazing around him, bewildered a little as he invariably was by the sudden transition from the silence and gloom of the great void to this brilliant and hurried scene. Across the great station at its departure-side a huge cargo-rocket was taking off, its firing-tubes deafening the ears as it thundered up into the sunlight and vanished. Already a great, sleek passenger-craft was being slid into the ascension-framework just vacated, and as its warning-bell rang out, the last belated passengers were hurrying toward it with their porters and luggage.

There remained to Evans the disagreeable task for which he had been bracing himself during the last hours of the trip—that of informing crusty old Commander Cain of his encounter with the Hawk. When he had been ushered into the office of the white-haired and white-mustached old space-veteran who was head of the Earth-Guard, Evans made his brief report with the other's stare piercing him to the marrow.

When he had finished, the Commander, as he had expected, delivered himself of a furious blast of profanity.

He finally became articulate. "Evans, you must realize what a situation the Earth-Guard is in. You know and I know that the Hawk must have something new on his ship, whether a new fuel or a new firing-tube, that gives his ship a speed beyond anything else in space. You know as well as I do, too, that the Hawk is really the one outstanding space-pirate left and that in the last decades we've cleared up the others one by one.

"But the public doesn't see it that way! The public," and the Commander smote his desk furiously, "the public sees only this one pirate, the Hawk. They see him and his crew defying the whole five hundred ships of the Earth-Guard. That's all the blankety blank public sees, and as a result the Earth-Guard's getting to be a joke!"

"But sir!" Evans managed to say, "we have no hope of getting the Hawk so long as he has his bases for refueling and resting. We must get his lunar base before we can get him, and that's why I think this Seaworth may win for us yet."

"Seaworth—." The Commander frowned thoughtfully. "It may be—it may be. I didn't know that the International Commission had put secret agents after the Hawk, but it may prove useful at that. You say Seaworth's going back with you next week?"

"Yes, he thinks the Hawk is after him in dead earnest, and that if he takes a passenger-rocket the Hawk will hold it up to get him."

"It wouldn't be beyond him," the Commander warned. "But we've another thing to think of, too, Evans. If the Hawk wants this man Seaworth badly enough, he may not even stick at holding up an Earth-Guard ship to get him! I see you smile—you think it is incredible that even the Hawk should ever try taking an Earth-Guard—but remember that he has a reputation for doing things no pirate ever dared do before, and that in this case he has the best reason in the world for trying it. And if he ever took an Earth-Guard rocket—good-bye! No matter what we did after that, the Guard would never be able to live it down!"

## Evans Endures It

EVANS was impressed. "I'll keep a close watch for him going back, sir," he promised.

The Commander's warning rang in Evans' ears all the week that followed, and he was forced during that week to admit that his superior's view of the situation was correct. The Earth-Guard was suffering a distinct loss of prestige. It seemed to Evans that wherever he went his blue Earth-Guard uniform, once an envied garb, was greeted with titters and derisive comments that made his ears burn.

The newspapers and teletheaters were exploiting the situation to the utmost. If Evans watched a troupe of dancers he was met with the spectacle of a nimble black-garbed figure, representing the Hawk, eluding with ease the slowly-moving blue-garbed figures symbolic of the Earth-Guard. If he was introduced to anyone by a joking friend it was always with a jesting reference to his imminent capture of the Hawk. Small boys called after him that the Hawk was coming, and then delightedly ran away.

The Hawk, indeed, was coming to have far more of the public sympathy than the Earth-Guard. It was true that he held up defenseless passenger-craft between earth and moon, forcing them under the menace of his guns to cast loose for him in their life-rockets whatever of value they carried. All knew that he was an outlaw of the void, and would meet swift death at the hands of a firing-squad were he captured.

But if he was a space-pirate, he was not one like the earlier space-buccaneers whose atrocities had roused a fury that had swept them out of existence. He was, if anything, a gentleman-corsair of the void, and though few had ever looked on his face, it was rumored that he was exceptionally handsome. It was small wonder that by the end of his week of relief Evans' nerves were ragged and he was longing for the peacefulness of the space patrol.

When on the last day of their relief he found Calden and Hartley at the New York station, inspecting the great Earth-Guard rocket, preparatory to its start back out into space, he found their nerves as raw on the subject as his own. They too had felt the whips of the public laughter.

"You know," growled Hartley as he ran a practised eye over the looming rocket's stern firing-tubes, "I'm just about praying that we meet up with the Hawk this trip. I'm not thin-skinned—but when my little daughter begins to ask daddy why he doesn't catch the Hawk, I'm getting to the busting point!"

EVANS and Calden laughed despite themselves. "Well, you may get your wish, Hartley," Evans told him. "Remember, Seaworth will be with us, and the Hawk wants him bad."

Hartley looked at him blankly. "You don't mean that he'd ever try holding us up? *Us!* An Earth-Guard rocket?"

Evans shrugged. "It's Commander Cain's idea, not mine. Here he comes now, to see us off. Evidently going to give us a final warning."

And that proved in fact to be the white-haired Commander's purpose when he reached them through the throngs of hurrying mechanics around the giant ship. He drew Evans aside from the others.

"Don't forget what I told you, Evans," he warned. "Keep double-watches in the lookout-cells at all times, and if the Hawk does appear, send out a general radiophone alarm before you engage. Remember, it isn't a question of personal glory, but a matter of catching him."

"I'll remember," Evans promised. "I guess we're set to go—here comes Seaworth now."

The secret agent's eyes were shining as he strode across the station to them. When he reached Evans and the commander he tapped the black leather case he carried.

"Got it!" he exclaimed. "My tip was a straight one and I've got the dope from beginning to end. You're ready to go?"

Evans nodded, and Commander Cain shook hands with him and with Seaworth, as he turned away.

"Good luck to the both of you," he told them, "and if you've really got anything that will enable you to nab the Hawk, I'll resign cheerfully on the day he's taken and you can slice dice between you for my job!"

Evans and Seaworth laughed together as the commander strode away. "The old man's nutty about the Hawk these days," Evans commented.

"Well, if I can get back to the moon with the information I have here," the other said, "it means the end for Mr. Hawk. I found the man I was hunting for—he'd been one of the Hawk's crew and had left him on account of some squabble over the division of loot. He was pretty much afraid of his old chief still—I guess the Hawk's got a deadly record as regards traitors—but he gave me all I wanted for a price. I have the exact location of the Hawk's base in one of the lunar cities, the names of the officials who've been harboring him and selling him fuel—all that we need."

"Once back on the moon we can set a trap there that will spring on the Hawk the first time he comes into his base. There's only one queer thing about it all, and that is that the man who told me all this disappeared on the very next day. No one has the slightest idea what became of him, though some of the officials I talked with thought he'd merely decamped with the price of his information. I don't know, though—it may have been something else."

"The Hawk?" Evans questioned, and the other slowly nodded.

"I'm afraid so—his way with traitors is short and sweet. It only worries me because if it was he, then he knows what I've learned and knows I'm taking back that information with me."

## Ready to Start

EVANS frowned. "That would make him desperate, all right. The Commander has an idea that he might even attack our rocket to get you, Seaworth."

"You mean that he'd even try to take an Earth-Guard rocket?"

"Yes, but it's just an idea. We'll keep a mighty sharp lookout for him, and whatever else the Hawk may have done, I think he's too wary a bird to try tackling Earth-Guard rockets."

They were interrupted by a thunderous blast of firing-tubes as a battered cargo ship of the tramp class, a quarter of its tubes out of commission, hurtled upward from the great ascension-framework. At once the huge machinery beside it that held the Earth-Guard rocket was sliding it smoothly into the ascension-framework to go out also. The warning-bell was jangling again and Calden and Hartley came up to the two men.

"All ready," Calden reported, saluting. "The starter's given us 9.40—that's eight minutes from now."

Evans nodded. "Time to go, Seaworth," and they strode toward the stern-door of the big, upreared craft.

"I see you've still got my little ship tacked on," Seaworth commented as they moved across the station.

"Yes, refueled and ready for you whenever we're near enough the moon for you to leave safely."

They passed inside and the stern-door closed and whirred as Hartley spun it carefully shut. Climbing the light metal ladders inside the upreared craft the four men gained the pilot-house, where Calden took his accustomed seat at the controls. Strapped into their shock-absorbing seats, the four men looked down over the station and its swarming throngs, a busy scene in the morning sunlight.

Just beside the ascension-framework rose the starter's tower, from which, at intervals, the streams of ships were allowed to start out into the various space-lanes. Lights were flashing and changing color on it each moment as the minute for the departure of the Earth-Guard ship drew near. Already the machinery beside the ascension-framework was ready to move into it the next rocket to start, a great passenger-craft into which hundreds of passengers were hastening, crowds of friends waving them bon voyage. Few in the station were paying any attention to the routine departure of the Earth-Guard's craft.

The lights on the starter's tower had flashed from yellow to green, and then to red. Calden was watching them imperturbably, his hands resting on the main firing-levers, while Evans, as always at the moment of starting, involuntarily drew a deep preparatory breath. Then the lights flashed suddenly pure white, Calden's hands depressed the levers with a single motion, and, as a thunderous blast of sound broke from the great rocket's stern beneath them, they were pressed with immeasurable force into their seats.

THE sunlit station had vanished in a flash from around them, and there was a dizzy lurching and trembling of the great mass as it shot upward and outward. From outside came a steady roar of air against the rocket's walls that was audible even above the thunder of continued explosions from the rear; and the air grew suddenly warm about them. Then the roar of air had ceased, the walls of the pilot-house were cooling, and the diffused bright sunlight of the atmosphere was gone. For in the immensity of space the sun flared fiercely on one side, while a rayless gloom, gemmed with steady-burning stars, stretched away on the other.

Ahead, the moon's brilliant disk, almost completely illumined by the sun, gleamed calm and white amid the throbbing fires of the encircling stars. Evans and Seaworth contemplated its beauty with a silent wonder that not even long familiarity with the sight could dull. Calden, meantime, was calmly checking over dials and controls, while Hartley had already gone below to sleep against the next watch at the controls. This vital station was filled by the craft's three officers in successive watches of four hours each.

In the hours that followed, Evans felt slipping away from him the hope that he had cherished of meeting the Hawk in straight battle in mid-space. Since Commander Cain's warning to him, he had persuaded himself that because of Seaworth's presence the Hawk might really attack. Like all others in the Earth-Guard, Evans desired nothing more ardently than a final battle with the elusive and dreaded corsair.

But though the lookouts at every one of the great rocket's observation-cells kept an unceasing watch through the void, no sign of the black rocket was to be seen. The Earth-Guard ship might have been alone in space, had it not twice caught sight of great cargo-rockets plowing their way moonward in the slower space-lanes, and once passed an earth-bound Earth-Guard craft closely enough in a neighboring lane to exchange with it a flashing "Salute" signal in passing.

When Evans ascended to the pilot-house for his third watch at the controls, thirty-two hours after their start from earth, the moon's gleaming sphere was huge in the heavens before them

"A dozen hours more and we'll be there," he commented disappointedly to Hartley and Seaworth, as he relieved the former at the controls. "I guess there's no chance of your wreaking your wrath on the Hawk this trip, Hartley."

"I told you it was crazy to think he'd tackle us," Hartley rejoined, "though I admit I've been hoping he would."

"Well, I haven't," Seaworth told them, grinning. "It may be just play to you lads in the Earth-Guard, but the Hawk nearly settled me twice and I hate to think what he'd do if he got me now."

"No danger," Evans told him as Seaworth followed the yawning Hartley down out of the pilot-house. "We'll have you safe and sound on the moon in a half day more, and if you can nab the Hawk there, it'll punish him for not showing up this trip."

LEFT alone in the pilot-house, Evans sat at the control-board with eyes glancing from one to another of the recording dials above it. Now and then he depressed a firing-lever, firing one of the rocket's side tubes to keep it from leaving its proper space lane, but for the most part the great craft hurtled steadily onward in its course, and he occupied himself in contemplating through the windows the moon's bright sphere and the dazzling light-patches on it that marked the position of the lunar cities.

Evans had been sitting thus in solitude at the controls for some minutes before he heard a strange popping sound from somewhere in the rocket's interior beneath him. He listened sharply, and heard other quick-following popping sounds, as of slight detonations; then came a babel of cries from beneath, cries that were cut sharply short! Evans sprang to his feet. There was silence below now, but suddenly the door of the pilot-house was flung open and Seaworth burst up into it, his face livid.

"The Hawk!" he gasped. And then, his eyes suddenly widening, he pointed out through the windows beyond Evans. "Look there!" he cried.

Evans whirled toward the window. In the next instant he seemed to see a curtain of flame descending before his eyes as something struck him a crashing blow on the head. The flame-curtain was succeeded instantly by the black depths of unconsciousness.

It was only slowly that he came back to himself. He became aware that he was sitting against the wall, that the thunder of the rocket's firing-tubes was coming to his ears, that his brain ached. He tried to move, but found that his hands were tightly tied, his feet were bound, and every movement made his head throb. He opened his eyes, then stared uncomprehendingly, as if stupefied.

He was sitting against the pilot-house wall, and a half-dozen feet from him, at the control-board, sat Seaworth. He was calmly manipulating the firing-levers, and he looked up and smiled as he saw Evans' astounded gaze upon him.

"It really was the Hawk after all, you see," he said. "Only instead of being outside the rocket he was inside!" He laughed with genuine amusement.

Evans struggled to speak. "Then you—you—"

"Yes, the Hawk, at your service," Seaworth calmly told him. "And as a word of friendly advice, Captain Evans—when someone tells you excitedly to look—look at *them*."

Evans, striving to understand, did not hear the mocking final words.

"You the Hawk! But we saw the Hawk's rocket attacking you there—we came and saved you—"

THE Hawk laughed again. "I'm sorry to take the glory of your rescue away from you, Evans, but it was really no rescue at all. You don't understand? It's simple enough. I decided some time ago that the possession of an Earth-Guard rocket would give me very great advantages in my trade of—ah—buccaneering. You see, every rocket in space will stop at the command of an Earth-Guard ship, and since they all look alike we could do just about as we pleased with the rocket-commerce if we had one. Therefore I decided to get one.

"It was easy. I merely embarked in a little one-man ship and when I knew your craft would be on the space-lane returning to earth, I had my crew, in our regular black rocket, stage a faked attack upon me. I called for help, you came; after a brief clash my crew fled as instructed, and you took me aboard. You'd seen the Hawk attacking me, and so believed me implicitly when I told you I was a secret agent whom the Hawk was anxious to capture. Secret agents, you should be aware, are really not so communicative as that. And of course, I couldn't expect you to know that my card was forged.

Then it was not hard for me to draw out from you the suggestion that I might return to the moon with you on this trip. That was just what I was playing for, of course—the chance to travel back in this rocket. My mission on earth was the purest falsehood—the only thing I did there was to enjoy the witty remarks about the Earth-Guard and the Hawk which I heard all around me. That case I brought with me held

(*Continued on page* 943)

# The Meteoric Magnet

By Moses Schere

(Illustration by Paul)

A purple beam of death reached toward us. Then a huge bolt of lightning struck the tower. The *Kate* swooped downward, and crashed into the bottom of Meteor Crater, a wreck.

## Foreword

UNTIL we have spent the money the Professor received for the stone he found in the meteorite, he and I prefer to remain anonymous. If we were to tell who we are, it would be very hard to buy anything—it would be given to us! For that reason, I refer to my friend only as "the Professor" in these pages.

Personally, I see no reason for being a millionaire and working at the same time. But then again, I am only a man of business, while the Professor is—well, a professor. He is trying to cut truncated cones out of the meteorite, probably for no other reason than to have the satisfaction of doing it.

I am writing this story of the meteoric magnet to answer two questions for a great many people. First:—Just *what* destroyed the *Fate*? Second:—What did the zealously guarded, mysterious excavation in Meteor Crater have to do with it?

## The Meteorite

A FEW months ago I read the following article over my morning cup of coffee:

MOLGRAVIAN SITUATION WORSE

Mobs Destroy U. S. Flags

SOFIA, June 6, 1938 (A.P.)—Following close upon the withdrawal of the American Ambassador, reports from near-by Molgravia state that insults and taunts have been heaped upon the United States without the slightest attempt at concealment, and apparently with government sanction. Mobs in the Molgravian capital, Xya, have gone so far as to publicly trample upon and tear to pieces flags looted from the American Embassy.

There is a general feeling of surprise in Europe and on this continent that a comparatively weak state such as Molgravia so willingly courts war with the United States. While some attribute this to the general strong feeling in Molgravia which has existed since the Anti-Balkan immigration law was passed, and declare that the present disturbances mean little, there is a wide-spread feeling of anxiety over the situation. The conclusion is general that the Molgravians have some reason for believing themselves stronger than the United States.

I stowed the paper away in my pocket and immediately forgot all about Molgravia and Molgravians. My business demanded that I should go to Winslow, Arizona, and the passenger plane to Phoenix left in half an hour

I did not realize at the time how lucky it was for me and for 150,000,000 other persons that I was going to Winslow, and not to any other city.

En route, the Molgravian situation appeared more and more prominently in the newspapers received at the main cities where my airplane stopped. And as is only natural when one is in close quarters with others, I soon fell into a friendly argument with the man seated across the aisle, concerning the prospects of war. He is now my fast friend, the Professor.

"But don't you see sir," I expostulated, as the discussion went on, "that Molgravia compared to this country is like a flea compared to an elephant? Why, before they could capture one of our cities we could wipe them out. Look at our air force. We have twelve thousand modern airplanes, as compared to their two hundred, bought second hand from a large government that couldn't use them any more."

"That only goes to prove my theory is correct," replied the Professor. "The Molgravians have something up their sleeve—if I may use the colloquialism,—perhaps some hidden weapon of enormous power, with which they can render our power useless. In my opinion, the United States should have considered its relations with the Balkans with more care, and especially with Molgravia, before we passed the Anti-Balkan immigration law."

MOSES SCHERE

"But in view of the plague of anthrax sweeping the Balkans, how could we permit immigration from that section of Europe?" I asked. "And as for any hidden weapon existing, that is against the terms of the Mutual Understanding Treaty, which, as you no doubt recall, was entered into when the League of Nations was declared a failure and dissolved three years ago."

"That plague of anthrax is very peculiar, in that Molgravia has suffered very slightly, while the surrounding countries have been hard hit," replied the Professor. "All things considered, however, I think that Molgravia has no actual cause for all the war talk she is making, unless you take into account the immigration law. True, we have had a little trouble at times between us, such as the occasion when one of our Merchant Marine vessels was held up for alleged non-payment of duties which the captain said had been paid. Although things like this tend to foment ill feeling, it is making mountains out of mole hills to call them causes for war. And in this statement given to the Amalgamated Press by the Molgravian government, which I clipped from this morning's paper, they have a formidable list of grievances against us that are the veriest trifles."

"You have nearly convinced me," I admitted. "You claim then, that there is 'method in their madness,' so to speak?"

"Decidedly," he beamed, in a most pedantic manner, "there is method in their madness."

After which rejoinder conversation lagged.

*ONE of the elements of aircraft that makes it such a dangerous weapon in war is its maneuverability. Aircraft can move in three dimensions, as compared with two dimensions of a land vehicle; and it also has unlimited space in which to maneuver. Future warfare in the air will therefore have to be done by a "long distance method," and machine guns will probably become as ineffectual as toy pistols.*

*Although rays of various kinds have been used a great deal by science fiction authors in order to portray the possibilities of weapons of war, we must not be blinded by this repetition to the underlying truth of the matter. There are literally dozens of possibilities in which a ray of one kind or another may be used against an object many miles away and reduce it to cinders. When such an eventuality comes to pass, protection against aircraft must be developed to keep pace with the aircraft's weapons.*

*Mr. Schere shows how such a defense might be devised accidently; and incidentally in this story, he works the idea to a very astounding climax, which, we are sure, no one will guess.*

SOON afterward we landed at the Phoenix airport and, after bidding good-bye to the Professor, I proceeded to board a local plane for the comparatively short trip to Winslow. The Professor mentioned that he too was going to that city, but he had first to purchase some apparatus in Phoenix. So I went on alone.

My business in Winslow has nothing to do with the story.

Suffice it to say that for two weeks, in a heat that would do credit to Central Africa, but had no right to exist in a country boasting any degree of civilization, I went from office to office of my clients.

Finally, after successfully consummating a number of deals, I breathed a sigh of relief and turned my thoughts to a little amusement before going back to New York. I went to a theatre, but it simply bored me. I needed some form of diversion not to be found in any average city. A lucky thought struck me—why not visit some of the natural wonders for which Arizona and her neighboring states are justly famed?

But where was the nearest worth while masterpiece of nature?

I started for the railroad station to find this out, and as I was going in I nearly bumped into my new friend, the Professor.

After we had greeted each other, I mentioned what I had in mind.

"Why, I know the very place," he exclaimed, "and it is just where I am going."

And that was all I could get out of him. With mysterious smiles he bade me wait. If the natural marvel he would show me did not fill me with awe and amazement, he would pay my fare back to New York. So, filled with wonder, and rather enjoying the sensation of suspense, I boarded an undersized train with the Professor and we travelled the short distance to Sunshine Station.

Sunshine Station lives up to its name. As one gets off the train he is struck by the sight of a limitless expanse of semi-arid plains scorched and drenched under the hot brightness of the sun. Except for the insignificant station, all that breaks the monotony of the deadly level is what appears to be some low hills a few miles away. Though generous in distances, the scene offered little that might appeal to a bored business man. I hoped that the Professor had not referred to this view.

An automobile of ancient vintage, which had evidently been awaiting the Professor, picked us up and we rolled along over the merest suggestion of a road toward the hills.

As we approached the low range, I began to notice peculiarities in its formation.

Perhaps a third of a mile in length, it rose in a gradual slope to a height of about 130 feet above the desert floor. It did not seem to end abruptly on either side, nor did it gradually merge with the desert. It seemed to curve around, out of my sight.

Most peculiar of all was its formation. It seemed to have been thrown up by a colossal explosion. Blocks of stone, some the size of small houses, were thrown about and rubble littered the desert for a long way before we came to the range.

For some distance the road skirted the range, following around it in a regular curve, then went up the side, where a large steel erection like an oil well derrick reared its head beside a small house. We reached the summit, and there was the marvel!

## The Crater

BEFORE my astonished gaze, like a giant's cup sunk in the desert, lay an enormous crater. For three miles, the range of hills swept around the mammoth pit, its bottom far below me. It was certainly a sight to marvel at.

"Are you satisfied?" I had almost forgotten the presence of the Professor in my amazement.

"Well, rather," I exclaimed, "what—"

He stopped me with a gesture.

"Not a word until we have cleansed ourselves of this abominable desert dust and refreshed ourselves with a little food. If you will do me the honor of being my guest?"

I accepted gladly.

He led me to the house. It was a small, though comfortable, structure with four rooms, and boasted a bath with sparkling water straight from a tap.

"It comes right out of the air," the Professor explained, when I expressed wonder at this phenomenon in the desert. "Too busy to patent it."

This was certainly a peculiar point of view. An invention for taking water directly from the air in quantities sufficient for household uses would certainly be worth millions!

After a refreshing shower and a change of clothes, the Professor led me to a compact dining room, through the windows of which we could see the expanse of the crater. A light lunch, served by a perfect Japanese servant, was quickly done away with, and the Professor settled back with a smile.

"Did you ever hear of Meteor Crater?" he asked.

Meteor Crater! In a flash I remembered an article I had once seen in a scientific magazine. So this was the grave of a giant meteorite that had struck the Earth in prehistoric times! This immense hollow was the grave of a mass large enough to crush to atoms the largest building in existence. Eagerly, I asked the Professor to tell me what he knew of it.

"Then you appreciate it," he began. "Good!

"In this crater we have a glimpse of the tremendous forces of the universe, most of which are luckily withheld from our Earth. Look at the crater! Could man make it? Yet many thousands of years ago there was a roar and a flash, a cloud of dust, and a celestial visitor had left its mark for us to wonder at. And not only its mark—for far beneath that crater lies the visitor itself, a mass of meteoric iron, fused in its journey through space, and lying here perhaps for eons of time.

"Ten years ago my attention was drawn to this pit by the failure of a co-worker in geology who drilled for the meteorite but failed to find anything but fragments. He did not go far enough. I started working when he left off, and reached the main mass only a year ago. It is three miles below the bottom of the crater."

"But what is your object in doing this?" I inquired.

"SOMETHING that may seem strange to you—scientific zeal. Fortunately, I am possessed of practically unlimited funds as a result of the invention of an apparatus for utilizing the power of the tides. By the way, I never told the public that it was I who invented that apparatus; I didn't want to be bothered. My university granted me an indefinite leave of absence—I would have resigned if they hadn't—and I have been working here pretty steadily ever since.

"From time to time I have invited intelligent people out here just to be able to talk to someone besides my foreman. You are welcome to stay as long as your business allows, and I assure you I will be glad to have you. All I ask is that you do not divulge anything of what you have seen until I see fit to make my investigations public."

I assented with delight, for the affair had taken on a great fascination for me. My business would allow me about two weeks of leisure.

The Professor now took me to see his work. We entered the structure I had seen on our arrival, and went into a small elevator. A workman—the Professor employed a large number of men—entered with us and attended to the operation of the elevator, which started down the shaft to the meteorite, three miles below.

As he went down, the Professor told me some interesting facts.

"The crater is approximately 4200 feet in diameter throughout, 440 feet below the desert and 570 feet below the rim of matter that was thrown up when the hole was created. At the time the meteorite struck the Earth, there must have been mud below a hard crust in this section, otherwise it could never have gone three miles deep. The character of the rock we dug through also goes to prove this, as it is evidently mud that has been turned into a soft rock through the effect of great pressure over a long period of time. The softness of the rock proved a hindrance rather than a help to our labors, as it was continually caving in. That's why it took me over

eight years to reach the meteorite with this shaft. Of course, my preliminary borings did not take very long, it was the digging of a shaft for an elevator that presented all the difficulty. I believe that my excellent foreman accomplished a wonderful feat of engineering when he finally completed this shaft and elevator system.

"A year ago I started work on the meteorite itself, and dug around and under it in every direction, so that the artificial cavern we have dug around it is now supported only by thick pillars of natural stone. I am putting the finishing touches to my excavations, and in about six months I expect to present the nation with a sort of underground museum."

I meditated on these wonders until the elevator stopped and we emerged through an air lock into a large cavern.

## Three Miles Down

WHEN my head had cleared from the unaccustomed effects of increased air pressure, I looked about.

One side of the cave was composed of dark metal—the meteorite. Tunnels led off in several directions from the other sides, with other tunnels under the meteorite. The cave contained supplies of food, gas masks and other essentials for safety, and many tools, chiefly electric drills.

The Professor led me through a bewildering maze of tunnels that everywhere skirted the side of the meteorite. On top of the mass another large cavern had been dug out, and here sections of the meteorite that had been polished gleamed with shifting colours in the glare of arc lamps. I could readily see that when the Professor gave the place to the public, it would be a delight to both layman and scientist.

After viewing the excavations, we went back to the cave where we had entered, and the Professor showed me the complicated apparatus he had installed in a side tunnel.

Not being in the least a mechanic, I cannot give any detailed account of the Professor's invention. It was a bewildering mass of pumps, valves and tubes on one side, and an equally incomprehensible assortment of levers, wheels, gears and wiring on the other side. The pumps and their connected gadgets, he explained, kept the air in the excavations at the proper temperature and pressure. He gave me an enthusiastic account of their operation, which did me not the slightest good, for I was in up to my neck in his first sentence and over my head in the second.

The machine he was less emphatic about. I gathered that it was some sort of apparatus which was not yet completed, designed to cut sections in the form of truncated cones from the meteorite. He would offer no explanation of his desire for truncated cones of meteoric iron, and smiled condescendingly when I suggested that it would be easier to cut out an irregular piece and grind it down to the desired shape.

We returned to the upper air soon after this, much to my relief. In spite of the nonchalance of the Professor, I could not feel easy with three miles of stone above my head!

Another excellent meal was served, this time out-of-doors on the veranda, where we were caressed by a cool night breeze. Then the Professor took me to see a collection of objects which had been found in the meteor, and which were foreign to its substance.

The collection of perhaps a score of objects consisted of dull-colored substances which I would have labelled "ores" and would forget about; but to the Professor each one told a story.

One thing which did mean something to me was a piece of slate-like substance the size of a silver dollar, on which was imprinted the unmistakable outline of a leaf. How many ages had passed, I wondered, since that imprint was made? Whence had it come? In my mind's eye I pictured a planet that had been covered with vegetation, an unthinkable distance from the Earth, an eon ago. But who can tell?

The Professor's greatest find was shown to me only after I had sworn a solemn oath of secrecy. With a triumphant look he opened a hidden drawer and uncovered a vision of loveliness, a thousand carat stone, flashing with a myriad colors, more beautiful than any diamond. Nature had formed it into a flawless crystal that could not be improved upon by cutting, although its composition was unknown. Its value would be immense. If the Professor had found this by only scratching the surface of the meteorite, what might he not find if he carried his borings into its heart?

A week passed on wings. Every day I went down in the shaft and watched the workmen uncover more and more of the meteorite, until so much had been laid bare that we were able to estimate its shape fairly accurately. It was roughly that of a horseshoe, with the ends pointing upward.

For some time I had not given a thought to the trouble we were having with Molgravia. The newspapers which were received regularly from Winslow said less and less about the subject, and the trouble seemed to be about to die out. Then one day a headline screamed at me:

MOLGRAVIA DECLARES WAR ON U. S.

AND so it started. If we of America had not been so confident, we might have evolved a system of defense before it was too late. Instead we dallied, half ashamed at our strength compared with our adversary's. But we did not know, during those early days of the *Fate* and the "combustion ray."

I will let some clippings I found in my scrap book tell how the United States discovered peril, a week after the declaration of war.

STRANGE TYPE OF AIRSHIP WITH NEW WEAPON WREAKS HAVOC IN MEXICO CITY

Now Headed North

MEXICO CITY, June 31.—A metal airship of enormous size, propelled by unknown means, appeared here at 6:40 A. M. to-day and destroyed the northern half of the city. The weapon used was a strange purple ray which fired immediately everything it struck. Houses were reduced to cinders with the people still in them. At least 50,000 persons are known to have perished.

Such was the first fragmentary report. Six hours later special editions of all newspapers gave further information.

Despatches from the country to the north of Mexico City indicate alarming news.

The marvelous airship which killed 50,000 persons in the Mexican capital early this morning has been fired upon by anti-aircraft guns. No apparent effect was visible, nor were the shells seen to explode. As an answer to the bombardment the airship used the death-dealing "combustion ray" it carries and turned the dozen guns which had fired upon it, along with their crews, into fused masses of steel and cinders.

The Televisor Company reports the receipt of a message in Molgravian from the airship on one of its specially tuned receivers. It was as follows:

"To the peoples of North America, and especially to those of the United States: Your time has come! For years we have prepared for this event—the assertion of our natural supremacy. At last Molgravia, supreme in all save in lands and resources, will take her rightful place on the earth and will occupy the North American continent, favored by nature above all other continents. It is the fate."

This message was spoken by Alexis Mazaroff, military dictator of Molgravia.

Such was a typical news article of that hectic period: bare facts, denuded of all additional detail by Federal order. Wisely the government feared the effect a highly colored narrative might have upon the more excitable of our population.

The last sentence of the message from the airship, "It is the fate," caught the popular fancy. The Molgravian airship was immediately named *Fate*, and the name, being taken up by the newspapers for convenience, became as well known a

title as the name of the President.

Feverish preparations for national defense were going on. Upon the televisor screens in homes throughout the country were shown views of airplane and ammunition factories, working at a terrific pace twenty-four hours a day. Automobile companies scrapped their coach-work equipment, welded armor plate on their chassis, and presented the army with armored cars by the thousand. Everywhere was the realization that now was no time to think of private gain. In the face of the common menace it must be "All for one, one for all."

Anything Molgravian was anathematized. A person of Molgravian birth was in constant danger of his life at the hands of mobs. Many a naturalized Molgravian had his home bombed.

Canada, sensing the common danger, joined forces with the United States, and sent us her fleets of airplanes and trains of guns.

## Coming of the *Fate*

AND what of the *Fate*?

Advancing slowly northward from Mexico City, it spread terrific destruction in its path.

The "combustion ray" was a thing unheard of, weird, gruesome. A house would be standing normally one moment, and the next it would be a charred mass, made so by the agency of an intangible, innocent-appearing ray. Half of Mexico City was reduced to ashes. Northward toward the United States came the *Fate*. Where once had been a stable, prosperous farming country, there was now a desolate waste. Effective for ten miles, the rays spared nothing within their compass.

When the slow-moving airship was about two hundred miles from the Rio Grande, a fleet of over 10,000 airplanes of the latest type was despatched from Washington to meet it and give battle.

For an hour they cast their fast-moving shadows over Meteor Crater as they sped southward to the border. The Professor and I watched eagerly, hopefully, as the magnificent fleet passed over our heads. It was the greatest air force ever assembled. Enough bombs and cylinders of gas were carried to level to the ground any city of the earth and exterminate all its inhabitants. Enough machine gun cartridges lay ready to wipe out the population of a large nation.

The hopes and prayers of the nation centered upon the speeding machines, as at 200 miles an hour they rushed at the foe.

Darkness came. Reluctantly the Professor and I gave up our watch of the skies. What had happened? There was no way of telling, for no televisors or wireless outfits had been carried with the fleet. The government had prepared for the worst. Wise heads at Washington had decided that in case of disaster it would be better to let the people hear a dry, concise report calculated to bring a full awareness of the danger that threatened.

Dawn! And then came the news, dashing all newly-risen hope of victory!

A handful of airplanes, remnant of the proud armada, had descended at a small Mexican town. Haggard men told of useless bullets and ineffectual bombs, of purple fingers of death forming great airplanes into molten tombs for their crews.

Then it was true, the story from Mexico, half-accepted and half-ridiculed by the average man. The *Fate* was coming to overthrow his government and desolate his land.

I will not dwell long upon that period of fear that gripped the nation in an icy clutch. We say as little as possible about that now-a-days. As a nation, we are heartily ashamed of the way we acted; how we rushed from church to church to save our souls, how we mobbed and fought to leave the country in plane and ship. Stark terror transformed as into a race of maniacs.

That was the United States. And what of the rest of the world?

SCORES of ships from friendly nations arrived to offer help. (Every nation that had signed the Mutual Understanding Treaty declared war on Molgravia.) Of course, they could do nothing against the *Fate*.

In Europe, armies of tanks and armored cars marched upon the Molgravian borders. Bomb-laden airplanes sped for Molgravian cities.

They were confronted by a solid ring of combustion rays that stretched around and over Molgravia. Every means of offense was rendered useless.

And so the steel airship slowly traversed 200 miles in three days, desolating everything in its path, and appeared over the Rio Grande. The United States is not a nation of fatalists; every usable airplane in the country was sent against the *Fate*. They were as ineffectual as so many butterflies. Disdaining to destroy them, the *Fate* went majestically on, moving miraculously through a steady hail of bomb and bullet. Another message went forth from its iron interior:

> "We will not destroy any more airplanes because we will need them when we have gained control of the continent. So bombard us, Americans, and make the most of your last days of independence. It is the *Fate*!"

We were hopeless now, even the most optimistic of us.

The Professor took me down for a last look at the meteorite.

"My workmen have placed several tons of explosives at intervals along the length of the elevator shaft," he explained, "and when the *Fate* reaches here—it is headed this way—I will press a switch and destroy the shaft. The Molgravians shall not have my work for themselves if I can prevent it."

His voice was inexpressibly sad. Ten years of labor and hope—to be made useless by the pressure of his hand.

My heart was too full for speech. I put my arm around the Professor's shoulders, and he tried bravely to force a smile.

"Last look," he whispered.

A rusty, pitted wall. A great many electric drills sticking in it, as the workers had left them. A maze of cables leading back up the shaft over our heads to relay switches and so on up to the surface where the control switch was. Machines and tools everywhere—and a bright glare of arc-lamps.

"My meteorite," a murmur from the Professor.

Mournfully, we entered the elevator and were taken back to the surface.

The long hot spell had broken up in an electrical storm. As I stood with my friend by the electric switch which was to set off the explosion and destroy the great shaft, I watched the lightning play about the steel tower above it. The tower was well protected against such contingencies with grounded wires, after the style of the lightning rod, for there was valuable apparatus within it.

There! A silver glint on the horizon. The *Fate*! Straight toward us it came. The Professor's face grew stern, his hand tightened on the switch.

And then—with the crashing of a thunderbolt— in my brain came an idea!

I pounded the Professor on the back, shook him, shrieked my plan at him. He stared, then bounded for a tool shed. I burst in upon the startled workmen in the midst of their preparations for leaving. I raved at them like a madman, then dashed out with all of them pell-mell after me in their Sunday best, all filled with a great hope.

We swarmed about the steel tower. With a hiss and a sputter, oxy-acetylene torches got into action. Wires fused and ran like water. Hammers rang, sparks flew insanely.

We were finished!

And now we must wait. Hearts pounding, we watched the steady approach of the *Fate*. Two miles away—a mile—half a mile—it hovered over the crater, and a purple beam of death reached toward us!

A huge bolt of lightning struck the tower.

The *Fate* swooped downward, and crashed into the bottom of Meteor Crater, a wreck!

## How It Was Done

PERHAPS you have guessed my idea.

Gentle reader, do you remember the many electric drills sunken in the meteorite? A cable led from each up through the shaft to an electric generator. We cut the cables at the top of the shaft and attached them to the steel tower. Then we melted through the grounding wires which led off the lightning charges from the structure.

The mighty flash of lightning came, just at the right moment. The enormous charge of electricity travelled down the cables, into the drills, and so into the meteorite. In a split second the great mass of iron, luckily correctly shaped, was transformed by the great surge of current into the most powerful horseshoe magnet the world has known.

With its engines ineffectual against the enormous pull exerted on it by the meteoric magnet, the steel airship was drawn down and dashed with crushing force against the bottom of the crater.

Its destruction ended the short war. The Molgravians did not have time to build another ship before their food supplies ran out, and as they were surrounded by enemies no food could be brought into the country. With its scant natural resources, the country had no chance. So after a frenzied session of the military leaders—at which there were two assassinations and three suicides—Molgravia delivered itself into the hands of the nations which had signed the Mutual Understanding Treaty. Several things were cleared up at the special international court which was immediately assembled.

The "combustion ray" was first dealt with. After a great deal of discussion, its secret was made the common property of a council representing the various governments.

With the terrible effects of any future war fully realized, the nations will now doubtless cease their endless bickering.

It was found that the Molgravians were responsible for the epidemic of anthrax which had caused the United States to pass an anti-Balkan immigration law. By means of secret agents who liberated billions of anthrax germs in population centers, Molgravia had crippled all the other Balkan states, maintaining her own health by general inoculation of an anti-anthrax serum that her physicians had discovered. As a result of the languished trade of the countries around her, Molgravia had acquired a great deal of wealth she could not have gotten otherwise. At the same time she began to create trouble with the United States by such things as unnecessarily holding up our commercial vessels and various other petty annoyances. All this, of course, was part of the general plan to arouse the conditions leading to a state of war. The plot to subjugate North America had been planned years in advance, beginning with the discovery of the "combustion ray" in 1931.

The wreck of the *Fate*, of course, proved a big attraction to the curious, and souvenir hunters would have destroyed it had not the state of Arizona put a barbed-wire fence around Meteor Crater. Only officials were admitted within the enclosure, and only such men were told of the meteorite, and the part it had played in saving the country.

The *Fate* was such a complete wreck that little could be deduced from its fragments. However, careful investigations over a period of months finally disclosed some important facts.

The airship had been propelled by an invisible ray which created a vacuum in front of it. There being no resistance in front of the ship, it was moved forward by the pressure on all other sides. Although this principle had been known before, the use of such a convenient thing as a ray instead of the conventional suction apparatus had not been perfected, and the ray proved a welcome contribution to aeronautics.

The ship had been kept in the air by a gas contained within it. This gas, which would have been of great value to civilization, was unfortunately all lost when its containers were smashed. Its lifting power must have vastly exceeded that of any known gas, judging from the estimated weight of the *Fate*. No formula of its composition could be found in Molgravian records.

It could not be ascertained why the shells and bombs directed at the Fate had failed to explode, though it was generally conceded that a repulsion screen might have produced this effect.

Investigations of the combustion produced by the "combustion rays" were started. A good deal was learned. The rays in some manner varied the molecular structure of the substances acted upon, speeding up molecular action to the combustion point.

The Professor does not care much about the "combustion ray" or the *Fate*. A far more interesting problem enthralls him.

He is wondering how he can demagnetize the meteorite sufficiently so that it will not pull his steel-rimmed glasses from his nose.

To date this problem remains unsolved.

THE END.


DO YOU WANT TO TAKE A TRIP TO VENUS

and see for yourself the mystery of that world that hides her secrets under miles and miles of steam-filled atmosphere?

TRAVEL TO VENUS with "THE CONQUERORS!"

Dr. D. H Keller, author of "The Human Termites" and "The Conquerors," has given us a sequel to the latter. It is called "The Evening Star" and appears in the April issue of SCIENCE WONDER STORIES—*now on sale.*

TRAVEL TO VENUS with "THE CONQUERORS!"

# The Flying Legion

by George A. England

*(Illustration by Paul)*

**Up came the rifles. Bordeur turned a knurled disc and from one of the boxes a sudden whining hum arose. "Fire!" said the Master.**

# THE FLYING LEGION

## What Has Gone Before

*The Master, a soldier of fortune, gathers together a Flying Legion of former soldiers, to make an exploration of Arabia.*

*They steal a huge airplane and fly over the Atlantic. One of the members of the Legion was a masked man named Captain Alden, who finally is revealed as a beautiful woman, who had served in the Great War as an aviator.*

*Nearing the coast of Africa, the Legion, now outlaws, are attacked by a great fleet of the International Air Police but by a mysterious ray the Master sends all of the aircraft plunging down to the water.*

*Later many of the airmen rise to it but the crippled ships manage to navigate to within a few hundred feet of the African coast.*

*There the Legion is attacked by a band of Arabian outlaws. But by means of a bomb gas the Master puts the Arabs to sleep and captures their leader, Sayid Abd el Rahman, a Moslem who had a priceless Moslem religious gem called the Great Star Pearl. Returning to the airships, the Legion separates and flies over Africa and finally come south a short distance of the Red Sea. Here the Master, by means of a magnetic ray, renders powerless thousands of Arabs worshipping the Black Stone of Mecca, and steals the relic. One of his men is seized by a fanatic attacking party. When Rissa, the Master's Arab servant, answers for the theft, the natives threaten murdering the Master and torturing Rissa. He chooses the latter course. By means of information gained from Rissa before his suicide, the Master discovers that a powerful Arab city of gold and Nasser skillfully takes the Legion to their destination, arriving at the city. The Master undertakes to impress the Arabs' emirs in a contest of "magic" with the native chieftain. In order to show his power, he asks the chief to cleave his head with a scimitar, and the Arab is about to comply.*

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UP whirled the Olema's blade, flickering in the sun. The metallic *click* of the brass switch synchronized with that sweep; Brodeur shifted the reflector by the fraction of a degree.

Bara Miyan's arm grew rigid, quivered a second, then dropped inert. From his paralyzed hand the scimitar fell to the grass. Brodeur threw off the ray; and the Master, unsmiling, stooped, picked up the blade and with a salaam handed it back, hilt-first, to the old man.

Only with his left hand could Bara Miyan accept it. He spoke no word, neither did any murmur run through the massed horsemen. But the shadow of a deep astonishment could not quite veil itself in the profound caverns of the old man's eyes.

"Strike again, Bara Miyan," invited the Master. "The other arm, perhaps, may not have lost its cunning!"

The Olema shook his head.

"No, by Allah!" he replied. "I know thy magic can numb the flesh, and it is a good magic. It is strong. But by the rising of the stars—and that is a great oath—the bullets of our long rifles can pierce thine unbelieving body!"

"Then bring six of thy best riflemen and station them a dozen paces from me," the Master challenged. "Let them look well to their cartridges. It is not *I* who load the guns with bullets made of soft black-lead, as the *Effendi* Robert-Houdin did long ago to the confusion of the Marabouts in Algeria. No, let thy men load their own rifles. But," and his voice grew mocking, "let their aim be good. Death is nothing, oh Bara Miyan, but clumsy shooting means much pain."

### A Test of Power

HIS tone galled the aged sheik, despite that impassive exterior. Bara Miyan beckoned, and with a command brought six riflemen from their horses.

"Load well, and shoot me this Frank!" exclaimed the Olema. A fire was burning in his eyes.

"*Aywa!*" (even so) replied one of the riflemen. "Allah will make it easy for us!"

"Have no fear, Bara Miyan," another said. "Not so easily shall El Kisa (the People of the Garment) be overcome by the Feringhi!"

*WE come now to the final installment of this masterpiece of aviation science fiction. We have been literally flooded by letters commenting on the science of this remarkable work by this well-known author. We will now see how the Master plays his final card in his amazing exploration of unknown lands; and though we agree with him or not in the purpose of his exploration, we cannot help but admire his mastery of a very difficult problem.*

*There are some who will question the right of an adventurer to penetrate, merely for a new thrill, lands that are closed to him for religious reasons. But it is characteristic of modern man, especially with such marvelous powers of exploration as Nisser, that he should feel that no secrets of the earth or beyond the earth should be denied him.*

*We are sure we will receive a great number of letters from our readers, commenting on both sides of this question.*

GEORGE ALLAN ENGLAND

Tension held Arabs and legionaries, alike. All remained calm, though had you watched "Captain Alden," you would have seen her fingers twisting together till the blood almost started through the skin.

The Master walked a few paces, turned and faced the squad.

"Are ye ready, men of Jannati Shahr?" asked he, with a smile.

"We are ready, unbeliever!"

"Then fire!"

Up came the rifles. Bordeur turned a knurled disk, and from one of the boxes on the grass a sudden, whining hum arose, like millions of angry hornets.

"*Fire!*" said the Master.

Six rifle-hammers fell with dull clicks. Nothing more.

The Master smiled in mockery.

"Oh Bara Miyan," said he, "let thy men reload and fire again! Perhaps the sweat of a great anxiety hath wet their powder!"

"Thou must indeed be *Khalil Allah,*" (a friend of Allah) he admitted. "No doubt thou art a great *caid* in thy own country. It is strong magic, Frank. But now behold what my imams can do!"

The riflemen, disgruntled but still Arab-like, holding their impassivity, returned to their horses and mounted again. At another call of Bara Miyan, three imams came from among the horsemen. They were dressed alike, in brilliant saffron gandouras, with embroidered muslin turbans from under which hung *daliks* or sacred plaits of hair; and each carried a plain white cloth in his hand.

In complete silence they showed the legionaries both sides of these cloths, then spread them on the grass. In not more than two minutes, a slight fluttering became visible. This increased and grew more agitated.

**This story started in our January issue. Back numbers can be had at the rate of 25 cents each.**

One by one, the imams gathered up the cloths, opened them and exhibited three bluish-black birds with vivid scarlet crests.

The Master nodded.

"It is an old trick," said he, indifferently. "I have seen hawks, much larger, come from under smaller clothes even in the great *suk* (market-place) at Cairo."

Bara Miyan made no answer. The imams drew knives from their belts of plaited goat-hair, and without more ado severed the birds' heads.

This the legionaries saw with perfect distinctness. The blood on the feathers was entirely visible. The bodies quivered. Calmly the imams, with reddened hands, now cut wings and legs from the bodies. They laid these dead fragments on the blood-stained cloths in front of them.

"Let every Frank behold!" exclaimed the Olema. The legionaries drew near. The imams gathered up the fragments in the cloths.

"Now," said the Master, "thy imams will toss these cloths in the air, and three whole birds will fly away. The cloths will fall to earth, white as snow. Is that not thy magic?"

Bara Miyan glowered at him with evil eyes. Not yet had his self-control been lost; but this mocking of the unbeliever had kindled wrath. The Master, however, wise in the psychology of the Arab, only laughed.

"This is very old magic," said he. "It is told of in the second chapter of Al Koran, entitled 'The Cow'; only when Ibrahim did this magic, he used four birds. Well, Bara Miyan, command thine imams to do this ancient magic!"

The sharp click of a switch on the control-board sounded as the imams picked up the little, red-dripping bundles. Silently they threw these into the air and—all three dropped back to earth again, just as they had risen.

A growl burst, involuntarily, from the Olema's corded throat. The growl echoed through the massed horsemen. Bara Miyan's hand went to the butt of his pistol, half-glimpsed under his jacket. That hand fell, numb.

"Look, oh sheik!" exclaimed the Master, pointing. The Olema turned; and there on the highest minaret of gold, the green flag had begun smouldering. As Brodeur adjusted his ray-focusser, it burst into bright flame, and went up in a puff of fire.

Only by setting teeth into his lip could the shiek repress a cry. Dark of face, he turned to the Master. Smiling, the Master asked:

"Perhaps now, oh Bara Miyan, thou wouldst ask thine imams to plant a date-stone, and make it in a few minutes bear fruit, even as the Prophet himself did? Try, if thou hast better fortune than with the birds! But have care not to be led into committing sin, as with these birds—for remember, thou hast shed blood and life hath not returned again, and El Barr is sacred from the shedding of blood!"

His tone was well calculated to make the lesson sink well to the Olema's heart—a valuable lesson for the Legion's welfare. But the Olema only replied:

"The blood of believers is meant. Not of animals—or Franks!"

"And wilt thou make further trial with me?" demanded the Master.

"No, by the Prophet. It is enough!" The Master's soul warmed toward the honesty of this bluff old Arab. "Thy magic is good magic. Give me thy salt, Frank, and take mine!"

The Master signalled to Brodeur as he drew forth his bag of salt. He stretched it out in his open palm; and all at once, bag, hand and arm up to the elbow enveloped themselves in a whirling mist and vanished from sight, even as the Master's whole body had vanished in the cabin when Leclair had tried to arrest him.

The sheik's eyes grew white-rimmed with astonishment. Vaguely he groped for the Frank's hand, then let his own fall limp.

"*Allahu Akbar!*" he gasped.

The Master nodded at Brodeur. The droning of the apparatus ceased, and again the hand became visible.

"Faith!" the major's voice was heard. "We've landed half a dozen home runs, and they've never even got to second!"

"Come, oh Bara Miyan!" the Master smiled. "Now we will put away the things of magic, and talk the words of men. Here is my salt!"

The sheik gingerly accepted a pinch, and with much misgiving put it into his mouth. He produced salt of his own, which the Master tasted.

"It is done," said the Master. "Now thou and I are *akhawat. Nahnu malhin!*" (We have eaten salt).

"But only from this midday till noon of the morrow," the Olema qualified the bond.

"Even so! Remember, though, that the salt is now in the stomachs of all thy people, both here and in the city, as it is in the stomachs of all my men!"

"I will remember."

"And now, oh Bara Miyan, I will show thee the very great gifts that I have brought thee!"

The Olema nodded, in silence. A great dejection held him and his men. The Master despatched half a dozen men for the Myzab and the Black Stone, also for three sticks of a new explosive he had developed on the run from the Sahara. This explosive, he calculated, was 2.75 times more powerful than TNT.

"Men," said he to the remaining legionaries, "be ready now for anything. If they show fight, when they realize we have touched the sacred things of Islam, let them have it to the limit. If the salt holds them, observe the strictest propriety.

"Some of us may go into the city. Let no man have any traffic with wine or women. If we commit no blunder, in less than twenty-four hours we shall be far away, each of us many times a millionaire. Watch your step!"

The six men returned, carrying the blanket that contained the sacred things. At the Master's command, they laid the heavy bundle on the grass before the Olema and his beaten men.

"Behold!" cried the Master. Gifts without price or calculations! Holy gifts rescued from unworthy hands, to be delivered into the hands of true believers!"

And with swift gestures he flung back the enveloping folds of the blanket, as if only he, the Master, could do this thing. Then as the Myzab and the Stone appeared, he drew from his pocket the Great Pearl Star, and laid that also on the cloth, crying in a loud voice:

"Oh, Bara Miyan, and people of Jannati Shahr, behold!"

## Into the Broad Paved Way

AN hour from that time, the Master and seventeen of the legionaries were on their way to the City of Gold.

The stupefaction of the Arabs, their prostrations, cries, prayers would delay us far too long, in the telling. But the oath of the salt had held; and now reward seemed to be near.

There could be no doubt, the Master reflected as he and his men galloped on the horses that had been assigned to them, with the white-robed and now silent horde, that the reward—in the form of exchange gifts—would be practically anything the legionaries might ask and be able to carry away.

Treachery was now not greatly to be feared. Even had the salt not held, fear of the explosive would restrain any hostile move. One stick of the new compound, exploded at a safe distance by wireless spark, had utterly demolished the stone which had been brought from the watercourse.

The plain statement given Bara Miyan that the Myzab and the Black Stone must be left on the grass until the Feringhi had again flown away toward their own country, had duly impressed the Arabs. They had seen two sticks of the explosive laid on the holy objects, and well had understood that any treachery would result in the annihilation of the most sacred objects of their faith.

The Master felt, as well he might, that he absolutely held the whip hand of the Jannati Shahr people. Elation shone in his face and in the faces of all. The problem now had simplified itself to just this: What weight of jewel and of gold could Nissr, by jettisoning every dispensable thing, whatsoever, carry out of El Barr, over the Iron Mountains and the Arabian Desert, back to the civilization that would surely make peace with the Legion which would bring such incalculable wealth?

Even the Master's level head swam a little, and his cool nerves tingled, as he sat on his galloping white horse, riding beside the Olema, with the thunder of the rushing squadrons—Arabs and his own men—like music of vast power in his ears.

He did not, however, lose the coldly analytic faculty that weighed all contingencies. The adventure still was critical; but the scales of success seemed lowering in favor of the Legion. The feel of the leather sack containing Kaukab el Dhurri, still in his breast pocket, gave added encouragement. This, the third and last gift, was to be delivered only at the last moment, just before Nissr should roar aloft.

"I think," reflected the Master, "the Pearl Star is an important factor. It certainly will put the final seal of success on this extraordinary bargain."

While his thoughts were busy with the pros and cons of the soul-shaking adventure now coming to its climax, his eyes were busy with the city wall and towers every moment closer, closer still.

The Master's knowledge of geology gave him the key to the otherwise inexplicable character of Jannati Shahr. This gold, in incredible masses, had not been mined and brought hither to be fashioned into a great city.

Quite the contrary, it formed part of the cliffs and black mountains themselves. Some stupendous volcanic upheaval of the remote past had cleft the mountain wall, and had extruded through the "fault" a huge "dyke" of virgin metal—to use technical terms. This golden dyke, two and a half to three miles wide and of undeterminable length and depth, had merely been formed by strong, cunning hands into walls, battlements, houses, mosques and minarets.

It had been carved out *in situ*, the soft metal being fashioned with elaborate skill and long patience. Jannati Shahr seemed, on a larger scale and a vastly more magnificent plan, something like the hidden rock-city of Petra in the mountains of Edom—a city wholly carved by the Edomites out of the solid granite, without a single stone having been laid in mortar.

Wonderful beyond all words as the early afternoon sun gleamed from its broad-flung golden terraces and mighty walls—whereon uncounted thousands of white figures had massed themselves—the "Very Heavenly City" widened to the legionaries' gaze.

On, up the last slope of the grassy plain the rushing horsemen bore. Into a broad, paved way they thundered, and so up, on, toward the great gate of virgin gold now waiting to receive them.

## CHAPTER XL
## Into the Treasure-Citadel

WELL might those legionaries who had been left behind to protect Nissr and the sacred gifts have envied the more fortunate ones now sweeping into Jannati Shahr. The rear guard, however, formed no less essential a part of the undertaking than the main body of the Legion.

This rear guard consisted of Grison, Menendez, Prisrend, Frazier and Manderson. Their orders were as follows: If the main body did not return by midnight, or if sounds of firing were heard from the city, or again if they received direct orders via the Master's pocket wireless, they were at once to load the machine guns on board the liner. They were to carry Myzab on board, also, and with the wireless spark detonate the explosive which would reduce the Black Stone to dust.

This accomplished, they were to start the engines and, if possible, make a getaway—which might be feasible for five men. If they succeeded, they were to wheel over the city and drop the second kappabomb, also all the remaining explosive, by way of punitive measure. Well-placed hits might wipe out most of the city and, with it, the population which had broken the oath of the salt.

The main body of the Legion would, of course, also perish in the débâcle if still alive; but the probability existed that before Nissr could take the air, all would already be dead.

The program was explicit. All five men of the rear-guard fully understood its every detail and all had sworn to carry it out to the letter. Their morale remained perfect; their discipline, under the command of Grison—left alone as they were in the midst of potentially hostile territory and with overwhelming masses of Mohammedans close at hand—held them as firmly as did that of the advance-guard now whirling up the wide, paved road to the gleaming gate of Jannati Shahr.

This band of hardy adventurers, stout-hearted and armed with service-revolvers, remained rather closely grouped, with the Arabs flanking and following them. At their head rode old Bara Miyan with the Master, who well bestrode his saddle with burnished metal peaks and stitching of silver thread. After them came the three imams, Major Bohannan, Leclair, and "Captain Alden."

The "captain's" mask seemed somewhat to impress the Arabs, who whispered among themselves concerning it. But not one suspected the sex of this Frank. The captain rode as gallantly as any, and with a firm hand reined her slim, white horse.

As the onthundering swarm of horsemen approached the pointed arch, some sixty feet wide by ninety high, its intaglios and complex arabesques flashing with millions of sunlit sparkles, a clear, sustained chant drifted out over the city and plain—the cry of some unseen muezzin, announcing news of great import to Jannati Shahr. Came an echoing call of trumpets, from far, hidden places in the city; and kettle-drums boomed with dull reverberation.

*"Labbayk, Allakuma!"* shouted Bara Miyan, announcing with praise to Allah his entrance into the City of Gold. A long, great shouting answered him from the massed thousands of white figures on the walls.

The Master saw innumerable dark faces peering down from snowy burnouses and haiks. He saw the gleam of steel. Not one of the figures on the wall was veiled. Not one woman, therefore, had as yet been permitted to leave the perfumed dimness of the harems, even for this stupendous event in the city's history. So far as the Master could judge, Captain Alden, lithely galloping close behind him, was the only woman visible in all that multitude.

With a bold clatter of hoofs, now loudly echoed and hurled back by the walls, the cavalcade burst up to the city like the foam-crest of a huge, white wave. For a moment, as the Master's horse whirled him in under the gate, he cast a backward glance at the plain and along the battlements.

That glance showed him a small, white-clad band of Arabs trudging afoot over the green expense—the men who, dismounting, had given their horses to the legionaries. It showed him the pinions of Nissr gleaming like snow on the velvet plain; showed him, too, the vast sweep of the city's walls.

Those walls, no less than a hundred feet high, were cunningly loopholed for defense. They presented a slightly concave façade to the plain, and slanted backward at about the angle of the Tower of Pisa.

Through their aureate glimmer, dazzling in the direct rays of the sun now well past its meridian, a glimpse of a flashing river instantaneously impressed itself on the Master's sight, with cascading rapids among palm-groves, as it foamed from beneath the city walls. Then all was blotted out by the gleaming side of the stupendous archway.

Up into a broad thoroughfare that rose on a steep slant—a thoroughfare very different from the usual narrow, tortuous alleys of Arabian cities—the swarm of horsemen swept, with a dull clatter of hoofs on the soft yellow pavement that gave almost like asphalt. The utter lack of any ruts well proved that wheeled vehicles were here unknown. Nothing harder than unshod horses, than goats and sheep and the soft pads of camels had ever worn these gleaming ways.

The brush of a Verestchagin, a Gérôme, a Bedt, skilled in the colors of the Orient, would have been needed to paint even an impressionistic *coup d'oeil* of this scene surpassing strange, now opening out before the legionaries' eyes. Its elements were golden houses with door and window-frames of cedar, sandal and teak; fretwork golden balconies overhanging streets and gardens where delicate palm-fronds swayed—balconies whence no doubt kohl-tinted eyes of women were peering at the strange men in khaki as henna-dyed fingers pulled aside silken curtains perfumed with musk and jasmine; mosques and minarets carven of the precious metal; dim streets, under striped silk awnings; a world of wonder to the Legion.

The Master saw, as the cavalcade swept along at unabated swiftness, glimpses of terraced roofs and cupolas tiled with blue and peacock hues; open-fronted shops hewn out of the all-present gold and displaying wares whereof the purchase-price could not be imagined, since gold was everywhere; bazaars heaped with babooshes, cherchias and robes of muslin, wool and silk; with fruits and flowers, tobacco, spices, sweetmeats and perfumes, and with strange merchandise unknown.

He caught swift vision of a wide *mirbad*, or open court for drying dates; and then, through a low, golden arch, a camel-yard with vast numbers of kneeling, white dromedaries. And everywhere he saw innumerable hosts of people of Jannati Shahr.

The streets themselves were clear of people as the cavalcade thundered on and on with many turnings; but every doorway, shop, arch, roof, terrace, and tower was packed with these silent, white-clad folk, bronze-faced and motionless, all armed with pistols, rifles, and cold steel.

What some poet has called "a joyous fear" thrilled the Legion. No, not fear, in the sense of timidity, but rather a realization of the immense perils of this situation, and an upspringing of the heart to meet those perils, to face and overcome them, and from out their very maw to snatch rewards beyond all calculation.

Even the Master himself, tempered in the fires of war's hell, sensed this tremendous potentiality of death as the tiny handful of white men galloped on and on behind Bara Miyan. Here the Legion was, hemmed and pent by countless hordes of fanatics whom any chance word or look, construed as a religious insult, might lash to fury. Five men remained outside. The rest were now as drops of water in a hostile ocean. In the Master's breast-pocket still lay Kaukab el Durri—and might not that possession, itself, be enough to start a *jihad* of extermination?

## Divided Emotions

WAS not the fact of unbelieving dogs now for the first time being in the Sacred City—was not this, alone, cause for a massacre? What, in sober reason, stood between the Legion and death? Only two factors: first, the potential destruction of the Myzab and the Black Stone in case of treachery; and second, two tiny pinches of salt exchanged between the Master and old Bara Miyan!

The situation, calmly reviewed, was one probably never paralleled in the history of adventure—more like the dream of a hashish-smoking addict than cold reality.

Very contending emotions possessed the hearts of the legionaries, in different reactions to their diverse temperaments. Only a vast wonder mirrored itself in some faces, a kind of numb groping after comprehension, a failure to believe such a thing possible as a city of pure and solid gold.

Others showed more critical interest, appreciation of the wonderful artistic effects of the carven gold in all its architectural developments under the skilled chisels of the Jannati Shahr folk.

Still others manifested only greed. The eyes of such, feverishly devouring walls, cornices, pillars, seemed to say:

"God! If we only had the smallest of these things, what a fortune that would mean! What an incredible fortune!"

Each man, reacting under the overwhelming stimulus of this wonder city, in his own expression betrayed the heart and soul within him. And thus, each absorbed in his own thoughts and dreams, silently the legionaries pondered as they galloped through the enchanted streets.

Some fifteen minutes' riding, with no slackening of the pace and always on an upward grade toward what seemed the central citadel of Jannati Shahr, brought the party to an inner wall, forty feet high and pierced by a triple-arched gate surmounted by a minaret of golden lacery.

Through the center arch rode Bara Miyan, now reining into a canter. The imams and the legionaries followed, and with them about fifty of the Arabs, of superior rank. The rest drew rein outside, still in silence.

### In Suspense

THE lessened cavalcade now found itself in what at first glance seemed an enchanted garden. Not even a feeling of anxiety caused by the silent closing of the hugely massive golden gates that, as they passed through, immediately blocked the triple exit, could divert the legionaries' minds from the wondrous park confronting them.

Date and cocoa-palms with shadowy paths beneath them; clear rills with bamboo thickets along their banks and with tangles of white myrtle, red clouds of oleanders that diffused an almond perfume, delicate hibiscus and unknown flowers combined to weave a magic woof of beauty, using the sifted sunlight for gold threads of warp.

Unseen water-wheels splashed coolly; vivid butterflies flickered through masses of greenery among the acacia, mimosa, lote and mulberry-trees. And there were color-flashing parrots, too, a-wing and noisy in the high branches; and apes that swung and chattered; and round the high, golden walls of the citadel, half-visible through the cloud of green and partly colored foliage, whirls of pigeons, white as snow, flicked against the gold.

The legionaries were hard put to it to obey the Master's order never to express surprise or admiration. But they kept silence, though their eyes were busy; and presently through another smaller gate they all clattered into a *kosh* or court facing what obviously must have been the central citadel of Jannati Shahr.

Bara Miyan pulled sharply on the red, silver-broidered reins and cut back the frothing lip of his barb. With a slide almost on its haunches, along the soft, golden pavement, the horse came to a quivering stand. All halted. And for a moment, the stamping of the high-nerved horses' hoofs echoed up along the tall citadel with its latticed windows and its machicolated parapet a hundred and fifty feet in air.

"Well ridden, oh, Frank! Well ridden by thee and by all thy men of Feringhistan!" exclaimed Bara Miyan, with what seemed real friendliness, as he sat there on his high saddle, gravely stroking his beard. "It was a test for thee and thine, to see, by Allah! if the men of the unbelieving nations be also men like us of Araby!

"We of the Empty Abodes are 'born on horseback.' But ye, white as the white hand Musa (Moses) have houses that, so I have heard, move on iron roads. And I see now ye have flying houses. Wherefore horses are not dear to you, as to us. But I see that ye can ride like men. Well done! *Ṣalaam!*"

The Master returned a *"Bikum"* of thanks. He would have been glad to wipe his forehead, streaming with sweat; and so, too, would the others. But pride restrained them. Not for them such weakness as the use of a handkerchief, in presence of these half-hundred grave-eyed, silently observing men of Jannati Shahr.

"Faith, though," the major whispered to Captain Alden, close beside him, "of all ways to take a walk, my favorite way *not* to is on an Arab horse with a saddle like the Inquisition! To-morrow, oh, my poor bones, to-morrow!"

Bara Miyan was speaking again, while the Master and Leclair—who alone of the legionaries understood Arabic—listened closely.

"Now that we have eaten salt and are *akhawat* brethren," said he, "we must break bread together. Let thyself and all thy men partake of food with us, oh, Frank! Then we will speak of the present we shall bestow on thee. *Bismillah!* Dismount, White Sheik, and enter!"

The Master bowed, and swung himself from his horse. All did the same, legionaries and Arabs alike. And for a moment they stood there in the sunlight before the long colonnade that occupied the lower story of the citadel; while from beneath that colonnade issued a dozen or fifteen of the black, muscular Maghrabi men, two of whom—in the role of official stranglers—they had already seen. These powerful half-savages took the horses away, the hoofs clacking hollowly on the golden pavement.

Bara Miyan led the way in under the colonnade, which, though of gold like all else in this wonder-city, still offered grateful shade. The perpetual glare of the golden roadways, houses, towers, balconies—even covered as many were with floating curtains of muslin or silk—had been trying to eyes and nerves. Infinitely preferable would stone or wood have been, for dwellings; but as Jannati Shahr was, so the Legion had to take it. And doubtless long generations of familiarity with it had made it wholly normal, pleasant and innocuous to these super-Arabs.

The Jannati Shahr men began kicking off their babooshes and slipping their naked feet into light slippers, rows upon rows of which stood under the portico. The Master and Leclair quickly put off their shoes and took slippers; the others followed suit. But not without unwillingness did the Master make the change.

"This will put us at a very serious disadvantage," thought he, "in case it comes to fighting. These people are used to going almost barefooted. We are not. Still, there's no help for it. But I'd like infernally well to keep my shoes!"

All he said was:

"Remember now, men, no women and no wine! If this city is like the usual Arab towns, there will be neither in sight. But if not, and temptations arise, remember my orders! No drop of any kind of liquor—and no flirtation. I'll deal summarily with any man who forgets himself. There's everything at stake now, in the next hour or two. We can't jeopardize it all for any nonsense!"

The major groaned, inwardly. Thirsts were on his Celtic soul that longed for dalliance with the Orient; but he well knew that tone of voice, and sadly resigned himself to abstinence.

"Keep your revolvers loose in the holsters, men," the Master added, as Bara Miyan gestured toward the slowly opening entrance of the citadel—a massive door as all doors seemed in Jannati Shahr; a door of gold reinforced with huge teak beams, "Watch for any sign of treachery, but don't shoot until I give the order. Then, shoot to kill! And whatever you do, stick together. Don't separate, no matter what the provocation! Now, follow me!"

A strange feeling of anxiety, almost of fear, had taken hold on the Master's heart. This fear was not in the least for himself or any of the men. Hard-bitted adventurers all, they had gone into this expedition with their eyes open, well knowing that some must inevitably die before its close. They had gambled at dice with Fate; and, losing, could have no complaint.

It was all for Captain Alden that the Master's anxiety was now awakened. Here was a woman, not only exposed to risks of death, but also of capture by Orientals—and what it might mean to a white woman to be seized for some hidden harem in Jannati Shahr the Master knew only too well. He found a moment's pause

to speak in a low tone to the captain, unheard by any of the others.

"Remember the mercy-bullet!" said he. "If anything happens and there's any risk of capture—remember, the last one for yourself! If the worst comes, we can at least share death together!"

"We can at least share death together!"

He gazed at her a moment, not quite fathoming her words, but with an inexplicable tightening round the heart.

The Master had no skill in self-analysis, to tell him. What were these uncomprehended, new emotions stirring in his hard soul, tempered by war and stern adventurings?

The Master had no skill in self-analysis, to tell him. Leader of others, himself he did not understand. But as that night aboard Nissr, when he had laid a hand on the woman's cabin door, something unknown to him seemed drawing him to her, making her welfare and her life assume a strange import.

"Come, oh, Frank!" Bara Miyan was saying. The Olema's words recalled the Master to himself with a start. "Such food and drink as we men of El Barr have, gladly we share with thee and thine!"

The old man entered the dark doorway of the citadel, noiselessly in soft sandals. Beside him walked the Master; and, well-grouped and flanked and followed by the Arabs in their white robes—all silent, grave, watchful—the Legion also entered.

Behind them once more closed the massive doors, silently.

The eighteen legionaries were pent in solid walls of metal, there in the heart of a vast city of fighting men whose god was Allah and to whom all unbelievers were as outcasts and as pariah dogs—anathema.

## CHAPTER XLI
### The Master's Demand

A DIM and subtly perfumed corridor opened out before them, its walls hung wtih tapestries, between which, by the light of sandal-oil *mash'als*, or cressets, the glimmer of the dull gold walls could be distinguished.

Pillars rose to the roof, and these were all inlaid with mother-of-pearl, with fine copper and silver arabesques of amazing complexity. Every minutest architectural detail had been carved out of the solid gold dyke that had formed the city; nothing had been added to fill out any portion. The imagination was staggered at thought of the infinite skill and labor required for such a task. The creation of this city of El Barr seemed far beyond the possible; yet here it was, all the result of the graver's chisel.*

Blasé as the legionaries were and hardened to wonders, the sight of this corridor and of the vast banquet-hall opening out of it, at the far end, came near upsetting their aplomb. The major even muttered an oath or two, under his breath, till Leclair nudged him with a forceful elbow. Not thus must Franks, from Feringhistan, show astonishment or admiration.

"May the peace be upon thee," all at once exclaimed Bara Miyan, gesturing for the Master to enter the vast hall. "Peace until the rising of the day!"

"And upon thee, the peace!" the Master answered, with the correct Arabic formula. They entered, and after them the other legionaries and the sub-chiefs of Jannati Shahr.

The banquet-hall was enormous. The Master's glance estimated it as about two hundred and fifty feet long by one hundred and seventy-five wide, with a height from golden floor to flat-arched roof of some one hundred and twenty-five. Embroidered cloths of camel's-hair and silk covered the walls. Copper braziers, suspended from the pillars, sent dim spirals of perfume-smoke aloft into the blue air.

About sixty feet from the floor, a row of clerestory windows, unglazed, admitted arrows of sunlight through a golden fret-work; and these arrows, piercing the incense vapor, checkered intricate patterns on the enormous, deep-piled Persian rugs of rose, lilac and misty blue.

Tables and chairs, of course, there were none. A *dakkah*, or platform in horseshoe shape at the far end, covered with rugs and cushions, and with water-jars, large copper fire-pans, coffee-pots of silver and *shishas*—water-pipes—told where the feast was to be offered.

From a side door, as a silken curtain was drawn back, some fifteen slave-girls entered—whiter than their masters and in tight jackets and short, gauze skirts. These girls brought copper basins of rose-water for the Arabs' "lesser ablution" before a meal. Bara Miyan smiled slightly as he gestured the legionaries also to wash hands and faces; but the Master, little relishing the idea of using this same water after the Arabs, shook his head.

Not thus slily could the Olema inflict humiliation on unbelievers. A hard look crept into the Master's eyes. This covert insult, after the exchange of salt, boded very ill.

In silence the legionaries watched the Arabs dry their hands and faces on towels given them by the slave-girls, who then noiselessly withdrew. All the Arabs prostrated themselves and prayed. The Master was the only one who noticed one significant fact: that now the *kiblah*, or direction of the prayer, was not to the northwest, where lay Mecca, but—judging by the sun—was almost due west, toward the spot where lay the Black Stone. This reassured him once more.

"They recognized the Stone, right enough," thought he. "As long as nothing happens to that, we hold the whip-hand of them. Our only real danger is that something *might* happen to it. But a few hours, now, will end all this. And in a few hours, what can happen?"

The Arabs ceased their droning supplications to Allah, which had been rising with hypnotically soothing murmurs through the incensed air, and now followed Bara Miyan toward the raised platform. The old sheik beckoned his guests. All disposed themselves comfortably among the cushions. The legionaries ignored what seemed a disposition on the part of the Arabs to separate them—scatter them along the platform.

"Keep together, men," the Master commanded. "Group yourselves closely here, in the middle. Say nothing. Watch everything. Make no move without specific orders. If it comes to a fight, and I am killed, Leclair will command you. His knowledge of Arabic temporarily ranks him above Bohannan. Don't shoot unless it comes to hard necessity; but if you do shoot, make every bullet count—and save the last one for yourselves!"

Bara Miyan clapped his hands. Through two arched doorways, to right and left, entered a silent file of the huge, half-naked Maghrabi men. All were unarmed;

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* If any reader doubts the existence of El Barr, as a city of gold carved from a single block, on the ground that such a work would be impossible, I refer him to an account of Petra, in the *National Geographic Magazine* for May, 1907. Petra, in all details, was carved from granite—a monolithic city.

but the muscles of their huge shoulders, the gorilla-like dangle of their steel-fingered hands produced an effect more ominous even than the gleam of simitars in the dim cresset light would have been.

Along the walls these black barbarians disposed themselves, a full hundred or more, saying nothing, seeming to see nothing, mere human automata. Bohannan, seated cross-legged between Captain Alden and the Master, swore a round oath.

"What are these infernal murderers here for?" growled he. "Ask the sheik, will you? I thought you and he had eaten salt together! If this isn't a trap, it looks too damned much like it to be much of a picnic! Faith, this is a hell of a party!"

"Silence, sir!" commanded the Master; while Leclair, at his other side, cast a look of anger at the Celt. "Diplomacy requires that we consider these men as a guard of honor. Pay no attention to them, anybody! Any sign of hesitation now, or fear, may be suicide. Remember, we are dealing with Orientals. The 'grand manner' is what counts with them. I advise every man who has tobacco, to light a cigarette and look indifferent. *Verb sap!*"

Most of the legionaries produced tobacco; but the Olema, smiling, raised a hand of negation. For already the slave-girls were entering with trays of cigarettes and silver boxes of tobacco. These they passed to the visitors, then to the Arabs. Such as preferred cigarettes, suffered the girls to light them at the copper fire-pans. Others, choosing a *shishah*, let the girls fill it from the silver boxes; and soon the grateful vapors of tobacco were rising to blend with the spiced incense-smoke.

A more comfortable feeling now possessed the legionaries. This sharing of tobacco seemed to establish almost an amicable Free Masonry between them and the Jannati Shahr men. All sat and smoked in what seemed a friendly silence.

The slave-girls departed. Others came with huge, silver trays graven with Koran verses. These trays contained meat-pilafs, swimming in melted butter; vine-leaves filled with chopped mutton; *kababs*, or bits of roast meat spitted on wooden splinters; crisp cucumbers; a kind of tasteless bread; a dish that looked like vermicelli sweetened with honey; thin jelly and sweetmeats that tasted strongly of rose-water. Dates, pomegranates and areca-nuts cut up and mixed with sugar-paste pinned with cloves into a betel-leaf—these constituted the dessert.

The Arabs ate with strict decorum, according to their custom, beginning the banquet with a *Bismillah* of thanks and ending with an *Al Hamd* that signified repletion. Knives and forks there were none; each man dipped his hand into whatever dish pleased him, as the trays were passed along. The legionaries did the same.

"Rather messy, eh?" commented the major; but no one answered him. More serious thoughts than these possessed the others.

After ablution, once more—this time the white men shared it—tobacco, pomegranate syrup, sherbet, water perfumed with *mastich*-smoke and thick, black coffee ended this meal.

### The Merrymaking

THE Master requested khat-leaves, which were presently brought him—deliciously green and fresh—in a copper bowl. Then while the slave-girls removed all traces of the feast, all relaxed for a few minutes' *kayf*, or utter peace.

Utter peace, indeed, it seemed. Nothing more soothing could have been imagined than the soft wooing of repletion and of silken cushions, the dim sunlight through the smoke incense and tobacco, the gentle bubbling of the water-pipes, the half-heard courting of pigeons somewhere aloft in the embrasures of the clerestory windows.

All possibility of warfare seemed to have vanished. Under the magic spell of this enchanted, golden hall, even the grim Maghrabis, black and motionless along the tapestried walls, seemed to have sunk to the rôle of mere spectators.

The Arabs' glances, though subtly curious, seemed to hold little animosity. Now that they had broken bread together, cementing the oath of the salt, might not hospitality have become inviolable? True, some looks of veiled hostility were directed against Captain Alden's strangely masked face, as the woman sat there cross-legged like the rest, indifferently smoking cigarettes. For what the Arab cannot understand is always antipathetic to him. But his hostility was not marked. The spirits of the Legion, including those of the Master himself, rose with a sense of greater security.

Even Bohannan, chronic complainer, forgot to cavil and began to bask in contentment.

"Faith, but this is a good imitation of lotus-land, after all," he murmured to Janina, at his side. "I wouldn't mind boarding at this hotel for an indefinite period. Meals excellent; waitresses beat anything on Broadway, atmosphere very restful to wandering gentlemen. Now if I could only get acquainted with one of these lovely Fatimas, and find out where the bar is—the bar of El Barr! Very good! Faith, very good indeed!"

He laughed at his own witticism and blew perfumed smoke toward the dim, golden roof. But now his attention was riveted by the silent entrance of six dancing-girls, that instantly brought him to keen observation.

Their dance, barefooted and with a minimum of veils, swayed into sinuous beauty to the monotonous music of kettle-drums, long red flutes and guitars of sand-tortoise shell with goat-skin heads—music furnished by a dozen Arabs squatting on their hunkers half-way down the hall. The sinuous weaving of those lithe, white bodies of the girls as they swayed from sunlit filigree to dim shadow, stirred even the coldest heart among the legionaries, that of the Master himself. As for Bohannan, his cup of joy was brimming.

The dance ended, one of the girls sang with a little foreign accent, very pleasing to the ears of the Master and Leclair, the famous chant of Kaab el Ahbar.

A little silence followed the ending of the song and the withdrawal of the girls and musicians. The major seemed disposed to call for an encore, but Janina silenced his forthcoming remarks with a sharp nudge. All at once, old Bara Miyan removed the amber stem of the water-pipe from his bearded lips and said:

"Now, White Sheik, thou hast eaten of our humble food, and seen our dancing. Thou hast heard our song. Wilt thou also see jugglers, wrestlers, trained apes from Yemen? Or wilt thou take the *kaylulah* (siesta)? Or doth it please thee now to speak of the gifts that my heart offers thee and thine?"

"Let us speak of the gifts, oh, Bara Miyan," answered the Master, while Leclair listened intently and all the Arabs gave close heed. "We have not many hours more to stay in this paradise of thine. We must be away to our own Feringhistan, in our flying-house. Let us speak of the gifts. But first, I would ask thee something."

"Speak, in Allah's name, and it shall be answered thee!"

"The salt is still in thy stomach for us?"

"It is still in my stomach."

"Thou dost swear that, oh, Bara Miyan, by a great oath?"

"By the rising of the stars, which is a great oath!"

"And by the greatest oath, the honor of thy woman?"

"Yea, Frank, by the honor of my woman! But thou and thine, too, have covenants to keep."

Old Bara Miyan bent shaggy white brows at the Master, and peered out intently from under the blood of his burnoose. The Master queried:

"What covenants, great Olema?"

"These: That no harm shall befall Myzab and the Great Pearl Star and the Black Stone, before thou and thine fly away to the Lands of the Books. Then, that no blood of our people shall be shed in El Barr, either the city of Jannati Shahr or the plain. These things thou must understand, oh, Frank. If harm befall the sacred relics, or blood be shed, then the salt will depart from my stomach, and we will be *kiman*,** and the *thar*** will be between thine and mine. I have spoken!"

The Master nodded.

"These things be very clear to my heart," he answered. "They shall be treasured in my memory."

"It is well. Now speak we of the gifts."

The fixed attention of the Arabs told the legionaires, despite their ignorance of Arabic, that at last the important negotiation of the reward was under way. Pipes and cigarettes smoldered, unsmoked; all eyes turned eagerly toward the Master and Bara Miyan. Silence fell upon the banquet hall, where still the thin, perfumed incense-smoke writhed aloft and where still the motionless Maghrabi men stood in those ominous lines along the silk-tapestried walls.

"And what things," began the Olema, "doth thy heart desire, in this city of Jannati Shahr? Ask thy wish, and perchance it shall be granted thee!"

The Master paused, deliberately. Well he understood the psychological value of slow action in dealing with Orientals. Bargaining, with such, is a fine art. Haste, greed, eagerness defeat themselves.

Contemplatively the Master chewed a khat-leaf, then smiled a very little, and asked:

"Is it permitted to tell thee that this gold, of which thou hast carved thy city—this gold which to thee is as stones and earth to the people of Feringhistan—hath great value with us?"

"It is permitted, oh, Frank. This thing we already know." The old man frowned ominously. "Dost thou ask gold?"

The Master nerved himself for the supreme demand, success in which would mean fortune beyond all calculation, power and wealth to shame all plutocrats.

"Gold?" he repeated. "Yea, that is what we ask! Gold! Give unto us what gold our flying-house can carry hence to our own land beyond the salted seas, and we will depart. Before the rising of the stars we will be gone. And the peace be unto thee, oh, Bara Miyan, master of the gold!"

Tension as of a wire about to snap contracted the Master's nerves, strong as they were. Leclair leaned forward, his face pale, teeth set hard into his lip.

"Yea, gold!" the Master repeated with hard-forced calm. "This is the gift we ask of thee, for the Myzab and the Holy Black Stone—the gift of gold!"

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* *W'al ars mablul bi matar.* A favorite refrain for songs among the Arabs, to whom rain represents all comforts and delights.

** *Kiman,* of hostile tribes. *Thar,* the terrible blood-feud of the Arabs.

## CHAPTER XLII

### "Sons of the Prophet, Slay!"

THE Olema shook an emphatic head of negation.

"*Yafta Allah!*" he exclaimed, using the absolute, decisive formula of refusal in Arab bargaining. "This gold of ours is sacred. The Angel Jibrail himself struck the Iron Mountains with his wing, at the same hour when the Black Stone fell from Paradise, and caused the gold to gush out. It is not earthly gold, but the gold of angels.

"Not one grain can be taken from El Barr. The curses of Jehannun, of Eblis, rest on Arab or Ajam who dares attempt it. Surely, such a one shall be put to the sword, and his soul in the bottom pits of hell shall be taken by the feet and forelock and cast into the hottest flames! That soul shall eat of the fruit of the tree Al Zakkum, and be branded forever with the treasure he did attempt to ravish from us!"

"Remember, great Olema, we did bring thee the Myzab and the Holy Black Stone!"

"I remember, White Sheik, and will reward thee, but not with gold!" The old man's face was stern, deep-lined, hard; his eyes had assumed a dangerous glitter. "Thou hast a good tongue, but though it speak from now till the angel Al Sijil roll up all the scrolls of life, it shall not avail for this.

"Ask some other thing; and remember, if thou dost try by any magic to remove even a sand-grain of this gold, the salt will be no longer between thee and me. This must be added to the two things I have already told thee of, that would take away the salt!"

Narrowly the Master eyed him, then nodded. Huge though this rebuff had been, and great as the loss must be, the Master realized the utter impossibility of coming to any terms with Bara Miyan on a gold basis. All the fanaticism of these people would resist this, to the death. Even to insist further might precipitate a massacre. Therefore, like the philosopher he was, he turned to other possibilities, considering what was best to be done.

The Olema spoke again, pausing now and then as he puffed reflectively at his water-pipe. Said he:

"I will tell thee a great secret, oh Frank. In this city lie the lost books of the Arwam (Greek) wise men and poets. When the Alexandrian library was burned by Amrou, at Omar's order, the four thousand baths of the city were heated for six months by ancient scrolls. I have heard that ye Feringhi have greatly mourned the loss of the Arwam learning and poetry. Not all this treasure was lost, White Sheik!"

The Master started, peered at Bara Miyan and forgot to chew his soothing khat-leaves.

"And then—?" asked he.

"Some twenty thousand of the most precious parchments were privily carried by our *sufis* to Medina, and thence, after many years, to Jannati Shahr. Here they still lie, in perfect form, clearly to be read. This is a treasure that would set the world of the Feringhi ablaze and make thee as a god among thy people. Ask this gift, oh Frank, and it shall be granted thee! For the mere asking, this treasure shall be thine!"

The Master shook his head. Deeply as he understood the incalculable value of the lost books of antiquity, he well knew that to offer his Legion such a booty would be all in vain. Men who have suffered and bled, risked all, seen their comrades die, and even now stand in the shadow of death—hoping some vast, tangible loot—are not proper material for discussion of literary values.

"*Yafta Allah!*" the Master exclaimed, with emphasis

equal to the Olema's. "No, Bara Miyan, this cannot be."

"Our dancing and singing maidens are like a flame of Paradise. Their enchantments make the heart of man glad with perpetual springtime. Choose, oh Frank, two handmaids for thyself and for each of thy men, and let them be yours to go with you to your own country and to be your chattels and your sweet delights!"

The eyes of "Captain Alden" narrowed with sudden, painful emotion as she peered at the Master. But he, unmoved by this second offer of Olema's, merely shook his head again, saying:

"No, Bara Miyan. Though thy women be fair as the dawn over the Sea of Oman, and soft-eyed as the gazelles in the oasis of the *Wady el Ward* (Vale of Flowers), not for us are they. We seek other rewards. Therefore will I ask thee still another question."

"Thy question shall be answered, oh Frank!"

"Is it true that the Caliph El Walid, in Hegira 88, sent forty camel-loads of cut jewels to Mecca?"

"That is true."

"And that, later, all those jewels were brought here to Jannati Shahr?"

"Even so! It is also true that two Franks in Hegira 550, digged a tunnel into the Meccan treasury from a house they had hired in the guise of Hadji (pilgrims). They were both beheaded, White Sheik, and their bodies were burned to ashes."

"No doubt," the Master answered, nonchalantly. "But they had brought no rich gifts to the Meccans. Therefore, now speaking of these forty camel-loads of cut jewels, oh Bara Miyan—?"

"It is in thy mind to ask for those, White Sheik?"

"Allah giveth thee two hearts, Bara Miyan, as well as the riches of Karun. Surely, 'the generous man is Allah's friend,' and thy hand is not tied up."*

The Olema, a quick decision gleaming in his eyes—though what that decision might be, who could tell?—put down the amber mouthpiece and with an eloquent, lean hand gestured toward a silk-curtained doorway at the right of the vast hall.

"Come with me, then White Sheik!" said he, arising and beckoning his white-robed sub-chiefs. He raised a finger in signal to the Maghrabis, though what the signal might mean, the legionaries could not know. "Come, with all thy men. And, by Allah! I will show thee the things whereof thou dost speak to me. I will show thee all these things—and others!

*"Come!"*

In silence the legionaries followed old Bara Miyan through the curtained doorway; and after them came the sub-chiefs. The Maghrabi stranglers, noiseless and barefooted, fell in behind; a long, ominous line of black human brutes, seeming hardly above the intellectual level of so many gorillas.

Stout-hearted as the legionaries were, a kind of numbing oppression was closing in upon them. City battlements and double walls of inner citadel, then massive gates and now again more doors that closed behind them, intervened between them and even the perilous liberty of the plain of El Barr. And, in addition to all this, some hundreds of thousands of Arabs, waiting without, effectually surrounded them! and the Maghrabi men cast their black shadow, threatening and ominous, over the already somber enough canvas.

A web, all felt, was closing about them that only chance and boldness could unravel. Everything now hung on the word of an aged fanatic, who for any fancied breach of the Oath of Salt might deliver them to slavery, torture, death.

"Remember, men," the Master warned his men as they penetrated the dim, golden-walled passage also lighted with sandal-oil *mash'als*—"remember the mercy-bullets If it comes to war, none of us must be taken prisoner!"

To the Olema he exclaimed, in suave tones: :

*"Dakhlak ya shayk* (Under thy protection, oh sheik). Let not the laws of hospitality or the oaths of the salt be forgotten!"

The Olema only smiled oddly, in the dim and perfumed obscurity of the passageway, along which the slither of the many sandalled feet on the gold pavement made a soft, creeping sound. Nothing more was said—except for some grumbled mouthings of Bohannan—during the next few minutes.

The passage seemed enormously long to the Master as, flanked by Leclair, "Captain Alden" and the major, he peered curiously at its smooth, dull-yellow walls all chased with geometrical patterns picked out in silver and copper, between the dull-hued tapestries, and banded with long extracts from the Koran inlaid in Tumar characters of mother-of-pearl.

## Trapped!

SEVERAL turnings, and three flights of steps descending through the solid gold "dyke" that ran down into the bowels of the earth no one could even guess how far, served still more to confuse the legionaries' sense of direction and to increase their conviction that, in case of any outbreak of hostilities, they would find themselves trapped more helplessly than rats in a cage.

It is no aspersion on their bravery to say that more than one among them had already begun inwardly to curse this wild-goose chase into Jannati Shahr. It all had now begun to assume absolutely the appearance of a well-formulated plan of treachery. Even the Master gave recognition to this appearance, by saying again: "Be ready for a quick draw. But whatever you do, don't be the aggressor. Watch your step!"

The passage suddenly reached its end. Another heavy door of the yellow metal swung back, and all issued into a hall even more vast than the one they had quitted.

No windows here admitted light. The air, though pure enough as from some hidden source of ventilation, hung dead and heavy. Not even the censers depending from the dim roof, far above, could freshen it; nor could the cressets' light make more than a kind of ghostly aura through the gloom.

By this dim half-illumination the Master beheld, there before him in the middle of the tremendous golden pavement, a strange, pyramidal object rising four-square in the shape of an equilateral triangle—just such a triangle as was formed by the locations of Mecca, Bab el Mandeb and El Barr.

This pyramid, polished and elaborately engraved, towered some ninety feet above the floor. It was pierced by numbers of openings, like the entrances to galleries; and up the smooth face nearest the entrance to the hall, a stairway about ten feet wide mounted toward the apex.

Completely finished all save the upper part, which still remained truncated, the golden pyramid gleamed dully in the vague light, a thing of awe and wonder, grimly beautiful, awesome to gaze up at. For some un-

* "To have two hearts" (*dku'kalbein*) signifies to be prudent, wise. *Karun* is the Arabic Croesus. "Thy hand is tied up" is equivalent to calling a man niggardly.

known reason, as the legionaries grouped themselves about their Master, an uncanny influence seemed to emanate from this singular object. All remained silent, as the Olema, an enigmatic smile on his thin, bearded lips, raised a hand toward the pyramid.

"This thing, oh Frank, thou shouldst see," he remarked dryly. "Above all, the inner chambers. Wilt thou go with me?"

"I will go," the Master answered. "Lead the way!"

The Olema beckoned one of the Maghrabis, who delivered a torch of some clear-burning, resinous and perfumed material into his hand.

"Come," bade the old man, and gestured toward the steps of gold.

Together, in silence, they mounted toward the dim, high-arched roof. From near the top, the Master, glancing down, could see the white-robed mass of the Arabs, the small, compact group of his own men; and, behind them all, the dim, black lines of the stranglers. But already the Olema was gesturing for him to enter the highest of the galleries.

Into this, carved in the virgin metal, both made their way. The torch-light flung strange, wavering gleams on smooth walls niched with dark embrasures. At the further end of the passage, the Olema stopped.

"Here is a new trophy, just added to all that Allah hath placed in our hands," said he, gravely. "There are some three-and-twenty places yet left, to fill. Wilt thou see the new trophy?"

The Master nodded silently. Raising the torch, the Olema thrust it into one of the embrasures. There the Master beheld a human skull.

The empty eye-sockets, peering out at him, seemed to hold a malevolent malice. That the skull had been but freshly cleaned, was obvious.

"Abd el Rahman?" asked the Master.

"Yea, the Apostate," answered Bara Miyan. "At last, Allah hath delivered him to us of El Barr."

"Thou hast used a heavy hand on the Apostate, oh Sheik."

"We of Jannati Shahr do not anoint rats' heads with jasmine oil. Tell me, Frank, how many men hast thou? Three-and-twenty, is it not so?"

"Yea, it is so. Tell me, Bara Miyan, this whole pyramid—?"

"Skulls, yea."

"This is the Pyramid of Ayesha that I have heard strange tales of?" the Master demanded, feeling even his hard nerves quiver.

"The Pyramid of Ayesha."

"No myth, then, but reality," the Master commented, fascinated in spite of himself. "Even as the famous Tower of Skulls at Jerba, in Tunis!"

"Thou hast said it, oh Frank. Here be more than ten-score thousand skulls of the enemies of Islam, of blasphemers against the Prophet, of those who have penetrated the Empty Abodes, of those who have sought to carry gold from El Barr. It is nearly done, this pyramid. But there still remain three-and-twenty vacant places to be filled."

For a long minute, the eyes of the Master and of Bara Miyan met, in silence, with the torch-flare glinting strange lights from them. Then the Olema spoke:

"Hast thou seen enough?" demanded he.

"Mine eyes are filled."

"And dost thou still ask rewards of gold?"

"Nay, it is as I have already told thee; let the cut jewels of the Caliph El Walid suffice!"

"It is well spoken. Let us descend."

In silence, again, they left the gruesome gallery and went down the stairway with the Olema's torch leaving vague, fantastic wreaths of odorous smoke curling up along the polished, dull-yellow slant of the pyramid. Back on the floor again, the Master said to his men:

"This pyramid is filled with skulls of men who have tried to carry gold from El Barr. For the present, we must dismiss gold from our minds. Common prudence dictates that we abandon all idea of gold, take whatever reward we can get, and leave this city at once.

"The gold is of no importance, whatever. On the way back over the outer foothills of the Iron Mountains, many outcrops of gold exist. Nissr can poise above some of these; and a few hours' labor will load her with all the gold we can carry. There can be no sense in trying to get any here. It would simply add to our peril.

"Everything is therefore quite satisfactory. But watch every move. If nothing breaks, in two hours from now we should be on our way. Again I caution you all, keep silent and make no move without my orders. The prize is at our very finger-tips. So long as we shed no blood and as nothing happens to the Myzab and the Black Stone, we are safe—but remember—*be careful!*"

The Olema touched him on the elbow.

"Now," the old man asked, "now, oh Frank, wouldst thou see the cut jewels of the Caliph El Walid?"

"Even so!"

"Come, then!" And Bara Miyan gestured toward another door that led, at the left, out of the Chamber of the Pyramid.

Again the strange procession formed itself, as before, with the gorilla-like Maghrabi stranglers a rear-guard. A few minutes through still another passage in the gold brought them to a door of ebony, banded with silver. No door of gold, it seemed, sufficed for this chamber they were about to enter. Stronger materials than the soft metal were needed here.

This door, like the others, swung silently on its massive hinges.

"Come, oh master of the fighting-men of Feringhistan!" exclaimed the Olema. "In Allah's name, take of the gifts that I have already offered thee, and then in peace depart!"

Before the Master could reply, a shuddering concussion shivered through the solid gold all about them. The tremor of this shock, like that of an earthquake, trembled the cressets on the walls and made the huge ebony door, ajar into a dim-lighted hall, groan on its hinges.

Stupefied, legionaries and Arabs alike, stared silently under the vague gleam of the torches.

Then, far and faint, as though coming along tortuous passages from distances above, a muffled concussion smote their ears. The shock of the air-wave was distinctly felt, eloquent of the catastrophe that in a second of time had shattered every plan and hope.

As if an echo of that thunderous, far explosion, a faint wailing of voices—echoing from very far above—drifted eerily along the passage; voices in blended rage and fear, in hate, agony, despair.

"God above—!" the major gulped. "Captain Alden" whipped her pistol from its holster, not a fraction of a second before the Master's leaped into his hand. The torch-light flickered on Leclair's service revolver, and was reflected on the guns of every legionary.

"If that's the explosive," Bohannan cried, "faith, we're in for it! *Is* it the explosive that's blown hell out o' the Black Stone?"

A wild cry echoed down the passage. The Olema,

his face suddenly distorted with a passion of hate, snatched a pistol from beneath his burnoose.

"The dogs of Feringhistan have spat on all Islam!" he screamed, in a shrill, horrible voice. "The Black Stone is no more! Vengeance on the unbelieving dogs! *Allah il Allah!* Kill, kill, and let no dog escape!

"Sons of the Prophet! Slay me these dogs! *Kill—Kill!*"

## CHAPTER XLIII
### A Battle Underground

HORRIBLE, unreal as a fever-born nightmare in its sudden frenzy, the Arab's attack drove in at them. The golden passageway flung from wall to wall screams, curses in shrill barbaric voices, clangor of steel whirled from scabbards, echoes of shots loud-roaring in that narrow space.

Bara Miyan's pistol, struck up by the woman's hand, spat fire over the Master's head just as the Olema himself went down with blood spurting from a jugular severed by the major's bullet. The Olema's gaudy burnoose crimsoned swiftly.

"Got *him!*" shouted Bohannan, firing again, again, into the tangle of sub-chiefs and Maghrabi-men. Adams pitched forward cleft to the chin by a simitar.

The firing leaped to point-blank uproar, on both sides. The men of Jannati Shahr numbered more pistols, but the legionaries had quicker firers. Arabs, legionaries, Maghrabis alike, falling in a tumult of raw passions, disappeared under trampling feet.

Deafening grew the uproar of howls, curses, shots. The smell of dust and blood mingled with the aromatic perfume of the cressets.

The Master was shouting something, as he emptied his automatic into the pack of white-robed bodies, snarling brown faces, waving arms. But what he was commanding, who could tell?

Like a storm-wave flinging froth ashore, the rush of the Moslems drove the legionaries—fewer now—back into the treasure-chamber. The Master, violent hands on "Captain Alden," swung her back, away; thrust her behind him. Her eyes gleamed through the mask as she still fired. The Master heard her laugh.

From dimness of gloom, within the doorway, two vague figures rained dagger-blows. Janina, mortally stabbed, practically blew the head off one of these door-keepers. Cracowicz got the other with a blow from the butt of his empty pistol—a blow that crushed in the right temporal bone. Then he, too, and three others, fell and died.

Outside, in the passage, the Maghrabis were wringing the necks of the wounded white men. The dull sound of crushed and broken bones blent with the turmoil.

*"The door—shut the door!"*

The Master's voice penetrated even this hell-tumult. The Master flung himself against the door and others with him.

The very frenzy of the attack defeated the Arab's object. For it drove the survivors back into the treasure-crypt. And in the narrow doorway they could for a moment hold back the howling tides of fury.

With cold lead, butts, naked fists, the remaining legionaries smashed a little clearance-room, corpse-heaped. They stumbled, fought, fell into the crypt.

The heavy door, swung by panting, sweating men—while others fired through the narrowing aperture—groaned shut on massive hinges.

As the space narrowed, frenzy broke loose. Arabs and Maghrabis crawled and struggled over bodies, flung themselves to sure immolation in the doorway. As fast as they fell, the legionaries dragged them inside. The place became an infernal shambles, slippery, crimson, unreal with horror.

For one fate-heavy moment, the tides of war hung even. Furiously the remaining legionaries toiled with straining muscles, swelling veins, panting lungs, to force the door shut, against the shrieking, frenzied drive of Moslem fanatics lashed into fury by the *thar*, the feud of blood.

"Captain Alden turned the tide. She snatched down one of the copper lamps that hung by chains from the dim ceiling of the treasure-crypt. Over the heads of the legionaries she flung blazing sandal-oil out upon the white-robed jam of madmen.

The flaming oil flared up along those thin, white robes. It dripped on wounded and on dead. Wild howls of anguish pierced the tumult. In the minute of confusion, the door boomed shut. Bohannan dropped a heavy teakwood bar into staples of bronze.

"God!" he panted, his right eye misted with blood from a jaggard cut on the brow. Shrieks of rage, from without, were answered by jeers and shouts of exultation from the legionaries.

*"Nom de Dieu!"* gasped Leclair. His neck blackened with a powder burn, and the tunic was ripped clean off him. Not one of the legionaries had uniforms completely whole. Hardly half of them still kept their slippers.

Torn, barefooted, burned, bleeding, decimated, they still laughed. Wild gibes penetrated the door of the treasure-crypt, against which the mad attack was already beginning to clash and thunder.

"Faith, but this is a grand fight!" the major exulted. "It's Donnybrook with trimmings!" He waved his big fists enthusiastically on high, and blinked his one good eye. "If a man can die this way, sure, what's the use o' living?"

"Steady men!" Steady!" the Master cautioned, reloading his gun. "No time, now, for shouting. Load up! This fight's only begun!"

Already, as they recharged their weapons, the door was groaning under the frantic attack of the Arabs and Maghrabis. Wild curses, howls to Allah and to the Prophet, came in dull confusion through the massive plates. A hail of blows beseiged them. The bronze staples began to bend.

"Come, men!" commanded the Master. "No chance to defend this position. They'll be in, directly. There are thousands of them, in reserve! Away from here!"

### Retreat

"WHERE the devil *to?*" demanded the major, defiantly. "Hang to it—give 'em blue hell as they come through!"

The Master seized and flung him back.

"If you're so keen on dying," he cried, "you can die right now, for insubordination! Back, away from here!"

The major obeyed. The others followed. Already the door was creaking, giving, as the legionaries—now hardly more than a dozen in number—began the first steps of their retreat, that should rank in history with that of Xenophon's historic Ten Thousand.

The Greeks had all of God's outdoors for their maneuvers. These legionaries had nothing but dark pits and runways, unexplored, in the bowels of a huge, fanatic city. Thus, their retreat was harder. But with courage unshaken, they turned their backs on the yielding door, and set their faces toward darkness and the unknown.

Two of their number lay dead inside this chamber where the legionaries now were. Nothing could be done for them; the bodies simply had to be abandoned where they lay. Eight were dead in the passage outside the chamber, their corpses mingled with those of Arabs and Maghrabis.

In the chamber, as the Master glanced back, he could see a heap of bodies round the door. These bodies of attackers who had been pulled inside and butchered, made a glad sight to the Master. He laughed grimly.

"We're more than even with them, so far," he exulted. "We've beaten them, so far! The rest will get us, all right enough, but Jannati Shahr will remember the coming of the white men!"

The survivors—the Master, Bohannan, "Captain Alden," and Leclair and nine others—were in evil case, as they trailed down the low-roofed chamber lighted with copper lamps. More than half bore wounds. Some showed bleeding faces, others limp arms; still others hobbled painfully, leaving bloody trails on the floor of dull gold. Curses on the Arabs echoed in various tongues. This first encounter had taken frightful toll of the Legion.

But every heart that still lived was bold and high. Not one of the little party entertained the slightest hope of surviving or of ever beholding the light of day. Still, not one word of despair or suggestion of surrender was heard.

Everything but a fight to the finish was forgotten. Only one man even thought of Nissr and of what probably happened out there on the plain. This man was Leclair.

*"Dieu!"* he grunted. "An accident, eh? Something must have gone wrong—or did the brown devils attack? I hope our men outside made good slaughter of these Moslem pigs, before they died. *Eh, mon capitaine?"*

"Well?"

"Is it not possible that Nissr and our men still live? That they will presently bombard the city? That they may rescue us?"

The Master shook his head.

"They may live," he answered, "but as for rescuing us—" His gesture completed the idea. Suddenly he pointed. "See!" he cried. "Another door!"

## CHAPTER XLIV
### Into the Jewel-Crypt

IT was time some exit should be discovered. The tumult had notably increased, at the barred entrance. The staples could not hold, much longer.

The legionaries pressed forward. At the far end of the chamber, another door was indeed visible; smaller than the first, low, almost square, and let into a deep recess in the elaborately carved wall of gold.

Barefooted, in their socks, or some still in slippers, they reached this door. A little silence fell on them, as they inspected it. One man coughed, spitting blood. Another wheezed, with painful respiration. The smell of sweat and blood sickened the air.

"That's some door, all right!" judged Bohannan, peering at its dark wood, heavily banded with iron. "Faith, but they've got a padlock on that, big enough to hold the Pearly Gates!"

"It is only a question, now, of the key," put in Leclair, with French precision.

"Faith, *here's* a trap!" the Irishman continued. "A trap, for you! And thirteen rats in it! Lucky, eh?"

"In Jannati Shahr," the memory of a sentence flashed to the Master, "we do not anoint rats' heads with jasmine oil!" But all he said was: "Light, here! Bring lamps!"

Three legionaries obeyed. The flare of the crude wicks, up along the door, showed its tremendous solidity.

"A little of our explosive would do this business," the Master declared. But it's obvious nothing short of that would have much effect. I think, men, we'll make our stand right here.

"If we put out all lights, we'll have the attackers at a disadvantage. We can account for fifty or more, before they close in. And—Captain Alden, sir! Where are you going? Back, here!"

The woman gave no heed. She was halfway to the entrance-door, round the edges of which already torchlight had begun to glimmer as the attackers strained it from its hinges.

Amazed, the legionaries stared. The Master started after her. Now she was on her knees beside one of the dead Maghrabis—the one killed by Janina. She found nothing; turned to the other; uttered a cry of exultation and held up a clumsy key.

Back over the floor of gold she ran. Her fingers held a crimson cord, from which the key dangled.

"Those two—they were guardians of this vault, of course!" she cried. "Here is the key!"

A cheer burst from the legionaries. The Master clutched the key, pressed forward to the inner door. A terrible intensity of emotion seized all the survivors, as he fitted the key to the ponderous lock.

"God!" the Irishman grunted, as the wards slid back. The padlock clattered to the floor. The hasp fell. In swung the door.

Through it pressed the legionaries, with lamps swinging, pistols in hand. As the last of them entered, the outer door collapsed with a bursting clangor. Lights gleamed; a white-robed tumult of raging men burst through. Shots crackled; yells echoed; and the sound of many sandaled feet, furiously running, filled the outer chamber.

*"Ah, sacrés cochons!"* shouted Leclair, emptying his pistol at the pursuers. The Master thrust him back. The door clanged shut; down dropped another bar.

Bohannan laughed madly. The fighting blood was leaping in his veins.

"Oh, the grand fight!" he shouted. "God, the grand old fight!"

Confused voices, crying out in Arabic, wheeled the Master from the door.

This inner chamber, very much smaller than the outer, was well lighted by still more lamps, though here all were chased silver.

At the far end, four dim figures were visible. Black faces peered in wonder. The legionaries caught the giant simitars, the flutter of white robes as the figures advanced.

"By Allah!" a hoarse shout echoed. "Look, Mustapha! The Feringhi!"

In the shadows at the other end, the amazed Maghrabi swordsmen hesitated one precious moment. White-rimmed eyes stared, teeth gleamed through distorted lips.

These gigantic *mudirs*, or Keepers of the Treasure, had expected the opening of the door to show them the Feringhi, indeed, but preceded by Bara Miyan and surrounded by men of Jannati Shahr.

Now they beheld the dogs of unbelievers all alone, there, with guns in hands, with every sign of battle. They had heard sounds of war, from without. Their dull minds, slowly reacting could not grasp the signifi

cance of all this.

"The Feringhi, Yusuf," cried another voice. "And they are alone! What meaneth this?"

"*M'adri* (I know not)," ejaculated still another. "But *kill—kill!*"

Their attack was hopeless, but its bravery ranked perfect. Their shouting charge down the chamber, sabers high, ended in grunting sprawls of white. Not half-naked like the low-caste Maghrabis outside, but clad in Arab fashion, they lay there, with legionaries' bullets in breast and brain.

The Master smiled, grimly, as he walked to one of the bodies and stirred it with his naked foot. He swung above it a silver lamp he had pulled down from the wonderfully arabesqued wall.

"Four simitars added to our equipment will be useful, at close quarters," he opined very coolly, unmindful of the dull uproar now battering at the inner door. "Pick up the cutlery, men, and don't forget the admirable qualities of the *arme blanche!*"

Himself, he took one of the long, curved blades. The major, Leclair, and Ferrari—an expert swordsman he had been, in the Italian army—possessed themselves of the others.

Bohannan whistled his simitar through the air.

"Very fine I call it!" he exclaimed, with a joyful laugh. "Some little game of tag, what?" And our Moslem friends are still 'it!' We're still ahead!"

"And likely to be, till our friends bring powder, mine the door and blow it in!" The Master added: "We've still a few minutes—maybe more. Now, then—"

A shrill cry in French, from Lebon, drew all eyes away to the left of the small chamber.

"*Voilà!*" the lieutenant's orderly was vociferating. They saw his distorted, torture-broken hand wildly gesticulating toward the floor. "My lieutenant, behold!"

"In the name of God, what now?" Leclair demanded, simitar in hand. The silver lamps struck high-lights from that gleaming blade, as he turned toward his orderly. Never had he seen the man seized and shaken by excitement as at this moment. "What hast thou found, Lebon? What now?"

"But—behold—behold!" choked the orderly. Articulation failed him. He stammered into unintelligible cries.

The legionaries crowded toward him. And in the dumb stupefaction that overcame them, the roaring tumult at the door was all forgotten. The sentence of death hanging above them, faded to nothing.

Even the Master's cold blood leaped and thrilled at realization of what he was now beholding as the silver lamps swung from out stretched hands. Bohannan, for once, was too dazed for exuberance.

Only the Master could find words.

"Well, men," said he, in even tones. "Here it is, at last. We're seeing something no Feringhi ever saw before—the hidden treasure of Jannati Shahr!"

## CHAPTER XLV
## The Jewel Hoard

MEN do strange things, at times, when confronted by experiences entirely outside even the limits of imagination. At sight of the perfectly overwhelming masses of wealth that lay there in square pits chiseled out of the solid gold, most of the legionaries reacted like men drunk or mad.

Leclair began to curse with amazing fluency in French and Arabic, while his orderly fell into half-hysterical prayer. Bristol—stolid Englishman though he was—had to make a strong effort to keep his teeth from chattering. The two Italians, one with an ugly wound on the jaw, burst out laughing, waving their arms extravagantly. Simonds shouted jubilation and began to jump about in the most extraordinary fashion. Wallace sat down heavily on the floor, held his lamp out over one of the pits and stared with blank incomprehension.

As for the major, he dropped to his knees, threw down his weapons and plunged his arms up to the elbows in the sliding sparkle of the gems. To have heard him babble, one would have given him free entrance into any lunatic-asylum.

The only two who had remained appreciably calm were "Captain Alden" and the Master. But even they, as fully as all the rest, forgot the impending menace of attack. For a moment, even their ears were deaf to the muffled tumult outside the door, their senses dulled to every other thing in this world save the incredible hoard there in the golden pits before them.

Pain, exhaustion, defeat ceased to be, for the legionaries. Ruin and the shadow of Azrael's wing departed from their minds. For, bring what the future might, the present was offering them a spectacle such as never before in this world's history had the eyes of white men rested on.

Not even a man *in extremis* could have turned away his gaze from the unbelievable masses of shimmering wealth in those square pits of gold.

Fairy-tales and legends, "Arabian Nights," and all the mystic lore of the East never conjured forth more brain-numbing plenitudes of fortune, nor painted more stupefying beauty, than now gleamed up from those eight excavations chiseled in the dull, soft metal.

"*Nom de Dieu!*" Leclair kept monotonously repeating. "*Mais, nom de Dieu!* Ah, the pigs—ah, the sacred pigs!" Disjointed words from the others—cries, oaths, jubilations—filled the low-arched chamber, mingling in the stuffy air with lamp-smoke and the dull scent of blood and dust and sweat.

Wheezing breath, wordless cries, grunts, strange laughter sounded. And, withal, the major's hands and arms in one of the pits made a dry, slithering slide and click as he kneaded, worked, and stirred the gems, dredged up fistfuls and let them rain down crepitantly again.

The sight was one very hard to grasp with any concrete understanding, harder still to render in cold words. At first, it gave only a confused impression of colors, like those in some vivid Oriental rug. The details escaped observation; and these changed, too, as the swaying of the lamps, in excited hands, shifted position.

A shimmer of unearthly light played over the pits, like the thin, colored flames at the edge of a driftwood fire. Soft, opalescent gleams were blent with prismatic blues, greens, crimsons. Melting violets were stabbed through by hard yellows and penetrant purples. And here an orange flash vied with a delicate old rose; there a rich carnation sparkled beside a misty gray, like fading clouds along the dim horizons of fairyland.

The Master murmured: "It's true, then—partly true. Rrisa knew part of it!"

"Not all?" asked the woman.

"I hardly think the Caliph El Walid's gold was ever brought to Jannati Shahr," he answered. "Coals to Newcastle, you know. And these jewels are not all uncut. Some are finely faceted, some uncut. But in the main Rrisa spoke the truth. He told what he believed."

"Yes," assented the woman. Then she added:

"Spartan simplicity, is it not? No elaborate coffers. Not even leather sacks. Just bins, like so much wheat."

"The shining wheat of Araby!"

"Of the whole Orient!"

So this was the secret of the Golden City of Jannati Shahr—the secret for whose betrayal poor loyal Rrisa had made the choice between death and the pangs of unquenchable remorse, and had unhesitatingly elected to plunge to bodily destruction!

They fell silent, peering with fixed attention. And gradually some calm returned to the others. At the door, too, the turmoil had ceased. No doubt the Jannati Shahr men, baffled, had sent for much gunpowder to blow in the massive planking. That silence became ominous.

Still the legionaries could take no thought of anything but the Caliph El Walid's hoard. As they stood, squatted, or knelt about the pits—pits about two and a half feet square and deeper than the deepest thrust of any arm—it seemed to them that bottomless lakes and seas of light were opening down, down below them into unfathomed depths of beauty.

Such beauty caused the soul to drink nepenthes of forgetfulness. Hardships, wounds, blood, pain, menace of death faded under that spell. That the legionaries were trapped at the bottom of a vast rabbit-warren, with swarms of Moslem ferrets soon to rush upon them, now seemed to have no significance.

Tranced, "indifferent to Fate," the adventurers peered on greater wealth of jewels than ever elsewhere in this world's history had been garnered in one place. The liquid light of the hoard flashed strange radiances on their tanned, deep-lined faces, now smeared with sweat and dust, with powder-grime and blood. Their eyes were beholding unutterable rainbows, flashings and burning glows like those of the Moslem's own Jebel Radhwa, or Mountain of Paradise.

Each of these jewels—several million gems, at the least computation—what a story it might have told! What a tale of remotest antiquity, of wild adventures and romance, of love, hate, death! What a revelation of harem, palace, treasury, of cavern, temple, throne! Of Hindu ghat, Egyptian pyramid, Persian garden, Afghan fastness, Chinese pagoda, Burmese minaret! Of enchanted moonlight, blazing sun, dim starlight! Of passion and of pain!

On what proud hand of Sultan, emir, cadi, prince had this huge ruby burned On what beloved breast or brow of princess, nautch-girl, concubine—yes, maybe of slave exalted to the purple—had that fire-gleaming diamond blazed?

From Roman times, from Greek, from ancient Jerusalem, from the fire-breathing shrines of Baal at long-dead Carthage, perhaps, this topaz might have come. This sapphire might have graced the anklet of some beauty of old Nile, ages before King Solomon wielded the scepter, ages even before the great god Osiris reigned.

That amethyst might have been loot of the swift black galleys of Tyre, in joyous days when men's strong arms took what they could, of women or of gems, and when Power was Law!

Imagination ran riot there, gazing down upon those jewel-pits. In them lay every kind of precious stone for which, from remotest antiquity, men had cheated, schemed, lied, fought, murdered. The jewels showed no attempt at sorting or classification. With true Oriental *laissez-faire,* they were all mingled quite at random; these gems, any chance handful of which must have meant a huge fortune.

## CHAPTER XLVI
### Bohannan Gets Rich

LIKE men in a dream, after the first wild emotions had died, the legionaries peered down into this sea of light. Smoke from the lamps rose toward the dim, low-arched roof. Blood from the Maghrabi's wounds slowly spread and clotted on the golden floor.

Without, a confused murmur told of continuing preparations to smash in the door. And through it all, the dry clicking of the gems made itself audible, as the major sifted them with shaking fingers.

The Master laughed dryly.

"Well, men," said he, "here they are! Here are the jewels of Jannati Shahr. Old Bara Miyan would probably have given us a peck or two of them, for Myzab and the Black Stone, if those hadn't been destroyed—"

"How do you know they've been destroyed?" the major cried. "How do you know but what we'll be rescued, here?"

"If the bombardment had been going to begin, I think we'd have heard something of it, by now. My judgment tells me there'll be no explosive dropped on Jannati Shahr.

"We've got to fight this thing through, unaided. And at any rate, we don't have to limit ourselves to a peck or two of jewels. We've got them all, now—or they've got us!"

The irony of his tone made no impression on Bohannan. His mercurial temperament seemed to have gone quite to pieces, in view of the hoard. He cried:

"Come on, then, boys! Fill up!"

And with a wild laugh he began scooping the gems, haphazard, into the pockets of his torn, battle-stained uniform. Jewels of fabulous price escaped his fingers, like so many pebbles in a sand-pit, and fell clicking to the golden floor. With shaking hands the major dredged into the pit before him, made with a very frenzy of greed.

"Stop!" cried the Master, sternly. "No nonsense, now!"

"What?" retorted Bohannan, angrily. His bruised, cut face reddened ominously.

"Drop those jewels, sir!"

"Why?"

"Principally because I order you to!" The Master's voice was cold, incisive. "They're worthless, now. No makeweights! We can't have make-weights, at a time like this. To think of jewels at such an hour! Throw them back!"

A flash of rage distorted the major's face. His blue eyes burned with strange fire.

"Never!" he shouted, crouching there at the brink of the jewel-pit. "Call it insubordination, mutiny, anything you like, but I'm going to have my fill of these! Faith, but I *will,* now!"

"Sir—!"

"I don't give a damn! Jewels for mine!" His voice rose gusty, raw, wild. "I've been a soldier of fortune all my life, and that's how I'm going to die. Poor, most of the time. Well, I'm going to die rich!"

His philippic against poverty and discipline tumbled out in a torrent of wild words, strongly tinged with the Irish accent that marked his passionate excitement. He sprang to his feet, and—raging—faced his superior officer. He shouted:

"Sure, and I've knocked up and down this rotten old world all my life, a rolling stone with never enough to bless myself with. And I've gone, at the end, on this wild-goose chase of yours, that's led you and me and all

the rest of us to a black death here in the bottom of a damned, fantastic, Arabian city of gold!

"That's all right, dying. That was in the bargain, if it had to be done. Two-thirds of us are dead, already, a damn sight better men than I am! We've been dying right along, from the beginning of this crack-brained Don Quixote crusade. That's all right. But, faith! now it's my turn to die, by the holy saints I'm going to be well paid for it!"

Bohannan, eyes wild, struck his heaving breast with a huge fist and laughed like a maniac.

"That's all right, you reaching for your gun!" he defied the Master. "Go ahead, shoot! I'm rich already. My pockets are half-full. Shoot, damn you, shoot!"

The Master laughed oddly, and let his hand fall from the pistol-butt.

"This," said he quite calmly, "is insanity."

"Ha! Insanity, is it? Well then, let me be insane, can't you? It's a good way to die. And I've *lived*, anyhow. We've all lived. We've all had a hell of a run for our money, and it's time to quit.

"Shoot, if you want to—a few minutes more or less don't matter. But, faith, I'll die a millionaire, and that's something I never expected to be. Fine, fine! Give me a minute more, and I'll die a multimillionaire! Sure, imagine that, will you? Major Aloysius Bohannan, gentleman-adventurer, a multimillionaire! That's what I'll be, and the man don't live that can stop me now!"

With the laugh of a madman, the major fell to his knees again beside the pit, plunged his hands once more into the gleaming, sliding mass of wealth, and recommenced cramming his pockets.

The Master laughed again.

"It's quite immaterial, after all," said he. "I led you into this. And now it's very nearly a case of *sauve qui peut*. The sooner your pockets are full, to the extreme limit, the sooner something like reason will return to you. Jewels being of interest to a man at death's door—it's quite characteristic of you, Bohannan. Help yourself!"

"Thanks, I will!" Bohannan flung up at him, blood drabbled face pale and drawn by the flaring lamp-light. "A *multi*-millionaire! Death? I should worry! Help myself? Faith, I just will, that!"

"Anyone else, here, feel so disposed?" the Master inquired. "If so, get it over and done with. We've got fighting ahead, and we'd better quench whatever thirst there is for wealth, first."

No one made any move. Only Bohannan's mind had been unsettled by the hoard, to the extent of wanting to possess it. Now that death loomed, empty pockets were as good, to all the rest, as any other sort.

"You're all a pack of damned fools!" Bohannan sneered. "You could die richer than Rockefeller, every man-jack of you, and you—you don't want to! Sure, it's *you* that's mad, not me!"

No one answered. They all stood peering down at him, their faces tense, wounded, dirty; their eyes gleaming strangely; the shadow of Azrael's wing already enfolding them. Then, a few detached themselves from the little group and wandered off into the gloom, away from the pits. Leclair muttered:

"*I* prefer my automatic, to loading my pockets! Odd, the major is, eh? Ah well, *à chacun sa chimère* (to each, his chimera)."

"Everybody's weapons fully loaded?" the Master demanded. "Be sure they are! And don't forget the mercy-bullets, men. These Arabs are rather ingenious in their tortures. They make a specialty of crucifying unbelievers—upside down. That sort of thing won't do, for us—not for fighting men of the Legion!"

Bohannan, laughing, stood up. Every pocket was a-bulge with incalculable wealth.

"Now I'm satisfied," he remarked in more rational tones. "I reckon I must be worth more money, as I stand here, than any human being that ever lived. You're looking at the richest man in the world, gentlemen! And I'm going to die, the richest. If that's not some distinction, what is? For a man that was bone-poor, fifteen minutes ago! Now, sir—"

A sudden cry interrupted him. That cry came from "Captain Alden."

"Here! Look here!"

"What is it?" demanded the Master. He started toward her, while outside the door sounded dull commands, as if the Arabs—now organized to effective work—were already preparing to blow open the last barrier between them and their victims.

"What now?" the Master repeated, striding toward her.

*"See! See here!"*

## CHAPTER XLVII
### A Way Out?

THE woman stood pointing into a black recess at the far end of the crypt. All that the Master could discern there, at first, was a darkness even greater than that which shrouded the corners of the vault.

"Light, here!" he commanded. Ferrara swung a lamp, by its chain, into the recess. They saw a low, square opening in the wall of dull, gleaming metal.

"A passage, eh?" the Master ejaculated.

"Maybe a cul-de-sac," she answered. "But—there's no telling—it may lead somewhere."

"By Allah! Men! Here—all of you!"

The Master's voice rang imperatively. They all came trooping with naked or slippered feet that slid in the wet redness of the floor. Broken exclamations sounded.

Seizing the lamp, the Master thrust it into the opening, which measured no more than four feet high by three wide. The light smokily illuminated about three yards of this narrow passage. Then a sharp turn to the right concealed all else.

Whither this runway might lead, to what peril or what trap it might conduct them, none could tell. Very strongly it reminded the Master of the gallery in the Great Pyramid of Gizeh, which he had seen twelve years before—the gallery which in ancient days had served as a death trap for treasure-seekers.

That gallery, he remembered, had contained a cleverly-hidden stone in its floor which once on a time had precipitated pilferers down a vertical shaft more than a hundred feet, to death, in the bowels of that terrifying mausoleum.

Was this passage of similar purpose and design? In all probability, yes. Oriental ways run parallel in all the lands of the East.

Nevertheless, the passage offered a means of escaping from the crypt. And there, with the dead Maghrabi *mudirs*, the legionaries could not stay. In a few minutes now, at most, the men of Jannati Shahr would be upon them.

"Faith, what the devil now?" exclaimed Bohannan, now seeming quite rational, as he peered into the cramped corridor. "Where to hell does this lead?"

"Just where you've said, to hell, it's more than likely," the Master retorted. "Come, men, into it! Follow me!"

He stooped, lamp in one hand, scimitar in the other, and in a most cramped posture entered the passage. After him came Leclair, the woman, Bohannan and the others.

The air hung close and heavy. The oppression of that stooping position, the lamp-smoke, the unusual strain on the muscles, the realization of a whole world of gold above and all about them, seemed to strangle and enervate them. But steadily they kept on and on.

The turning of the passage revealed a long, descending incline, that sloped down at an angle of perhaps 30°. A marked rise in temperature grew noticeable. What might that mean? None could imagine, but not one even thought of turning back.

The walls and floor in this straight, descending passage were now no longer smooth, arabesqued, polished. On the contrary, they showed a rough surface, on which the marks of the chisel could be plainly seen as it had shorn away the yielding metal in great gouges. Streaks of black granite now began to appear; and these, as the legionaries advanced, became ever wider.

## Old Moslem Wine

THE Master understood they were now coming to the bottom of part of the golden dyke. Undeviated by the hard rock, the tunnel continued to descend, with here and there a turn. Narrowly the Master scrutinized the floor, tapping it with the scimitar as he crept onward, seeking indications of any possible trap that might hurl him into bottomless, black depths.

Quite at once, a right-angled turning opened into a small chamber not above eight feet high by fifteen square. In this, silent, listening, the sweating fugitives gathered.

The temperature was here oppressive, and the lamps burned blue with some kind of gas that stifled the lungs. Gas and smoke together made breathing hard. A dull roaring sound had begun to make itself vaguely audible the past few minutes; and as the legionaries stood listening, this was now rather plain to their ears.

"This is a hell of a place for a multimillionaire, I must say!" Bohannan exploded. Simonds laughed, with tense nerves. One or two others swore, bitterly cursing the men of El Barr.

The Master, "Captain Alden" and Leclair, however, gave no heed. Already they were peering around at the black walls where now only an occasional thread of gold was to be seen.

Five openings led out of this singular chamber, all equally dark, narrow, formidable.

"This seems to be a regular labyrinth, my captain," said Leclair, in French. "Surely a trap of some kind. They are clever, these Arabs. They let the mouse run and hope, then—*voila*—he is caught!"

"It looks that way. But we're not caught yet. These infernal passageways are all alike, to me. We must choose one. Well—this is as good as any." He gestured toward an aperture at the left. "Men, follow me!"

The passage they now entered was all of rock, with no traces whatever of gold. For a few hundred feet its course was horizontal; then it plunged downward like the first. And almost immediately the temperature began to mount, once more.

"Faith, but I think we'd better be getting back!" exclaimed the major. "I don't care much for this heat, or that roaring noise that's getting louder all the time!"

"You'll follow me, or I'll cut you down!" the Master flung at him, crouching around. "I've had enough insubordination from *you*, sir! Not another word!"

The stooping little procession of trapped legionaries once more went onward, downward. The muffled roar, ahead of them, rose in volume as they made a final turning and came into a much more spacious vault where moisture gutted from the black walls. A thin, streamy vapor was rising from the floor, warm to the bare feet.

A moment the legionaries stood there, blinking in the vague lamplight, glad of the respite that permitted them to straighten up and ease cramped muscles.

"No way out of *here!*" Bohannan grumbled. "Sure, we're at the end o' nowhere. Now if we'd only taken another passage—"

Nobody paid him any heed. The major's exhibition of irrational greed had lost caste for him. Even Lebon, the orderly, curled a lip of scorn at him.

All eyes were eagerly searching for some exit from this ultimate pit. Panting, reeking with sweat, fouled with blood and dirt, the doomed men shuffled round the vault, blinking with bloodshot eyes.

No outlet was visible. The vault seemed empty. But all at once Bristol uttered a cry. "Wine-sacks, by the living jingo!" he exclaimed.

"Wine-sacks,—in a Moslem city?" demanded the Master. "Impossible!"

"What else are these, sir?" the Englishman asked, pointing.

The Master strode to the corner where he stood, and flared his lamp over a score of distended goat-hides.

"Well, by Allah!" he ejaculaated.

"Sacrificial wine," put in Leclair, at his elbow. "See the red seals, with the imprint of the star and crescent, here and here?" He touched a seal with his finger. "Rare old wine, I'll wager!"

"Wine!" gulped the major, whose excitable nerves had been frayed to madness. "Wine, by God! Faith, but it's the royal thirst I've got on me! Who's got a knife?"

The Master thrust him back with such violence that he slipped on the wet floor and nearly fell.

"You'll get no knife, sir, and you'll drink no sacrificial wine!" he cried, with more anger in his voice than any of the Legion had yet heard. "The jewels—yes, I gave you your fool's way, on those. But no wine!

"We of the Flying Legion are going to die, sober men! There'll be no debauchery—no tradition handed down among these Moslem swine that they butchered us, drunk. If any of you men want to die right now, broach one of those wine-sacks!"

His scimitar balanced itself for action. The glint in his eye, by the wavering lamp-shine, meant stern business. Not a hand was extended toward the tautly distended sacks.

Bohannan's whispered curse was lost in a startled cry from Wallace.

"*Here's* something!" he exclaimed. "Look at this ring, will you?"

They turned to him, away from the wine-bags. Wallace had fallen to his knees and was scraping slime from the wet floor—the slime of ages of dust mingled with viscid moisture from the steam that, thinly blurring the dark air, had condensed on the walls and run down.

Emilio thrust down the lamp he held. There on the stone floor, they saw a huge, rust-red iron ring that lay in a circular grove cut in the black granite.

This ring was engaged in a metal staple let into the stone. And now, as they looked more closely, and some of legionaries scraped the floor with eager hands, a crack became visible in the floor of the vault.

"Look out, men!" the Master cautioned. "This may

be a trap that will swing open and drop us into God knows what! Stand back, all—take your time, now! Go slow!"

They heeded, and stood back. The Master himself, assuming all risks, got down on hands and knees and explored the crack in the floor. It was square, with a dimension of about five feet on the edge.

"It's a trap-door, all right," he announced. "And we—are going to open it!"

"One would need a rope or a long lever to do that, my captain," put in Leclair. "It is obvious that a man, or men, standing on the trap, could not raise it. And it is too large to straddle."

The Master arose, stripped off his coat and passed it through the ring. He twisted the coat and gave one end to the lieutenant. Himself, he took the other.

"Get hold, everybody!" he commanded. "And be sure you're not standing on the trap!"

All laid hold on the ends of the coat. With a "One, two, three!" from the Master, the legionaries threw all their muscle into the lift. "Now, men! Heave her once more!"

The stone gave. The legionaries doubled their efforts, with panting breath, feet that slipped on the dank floor, grunts of labor.

*"Heave her!"*

Up swung the stone, aside. It slid over the wet rock. There, in its place, gaped a black hole that penetrated unknown depths.

Steam billowed up—or rather, vapor distinctly warm to the touch. And from very far below, much louder boomed up the roar of rushing waters. The legionaries knew, now, what had caused the dull roaring sound. Unmistakable, a furious cascade was boiling, swirling away, down there at undetermined distances of blackness.

The boldest men among the little group of fugitives felt the crawl and fingering of a very great dread at their hearts. Behind them lay the labyrinth, with what pitfalls none could tell and with the Jannati Shahr men perhaps already penetrating into the crypt. Around them loomed the black wet walls of this lowest stone dungeon with but one other exit—the pit at their feet.

The Master threw himself prone on the slippery floor, took one of the lamps and lowered it, by the chain, to its capacity. Smoke and vapor arose about his head as he peered down.

"Well, what is it?" demanded Bohannan, also squinting down, as he bent over the hole. "What do you see?"

"Nothing," the Master answered. "Nothing definite."

He could, in fact be sure of nothing. But it seemed to him that, very far below, he could make out something like a swift, liquid blackness, streaked with dim-speeding lines of white that dissolved with phantasmagoric rapidity; a racing flood that roared and set the solid rock a-quiver in its mad tumult.

"Faith, an underground river of hot water!" ejaculated the Irishman with an oath. "Some river!"

"Warm water, at any rate," the Master judged, getting up again. A strange smile was in his eyes, by the smoky lamplight. "Well, men, this is our way out. The Arabs are not going to have any slaughter of victims, here. And what is more, they'll capture no dead bodies of white men, in *this* trap! There'll be at least ten skulls missing from that interesting golden Pyramid of Ayesha!"

"For God's sake!" the major stammered. "What—what are you going to—do, now? Jump down that shaft?"

"Exactly. Your perspicacity does you credit, major."

"Sure, you'll never catch *me* jumping!"

"Gentlemen," the Master said, in a low, quiet voice, "I regret to state that we have one coward among us."

## CHAPTER XLVIII
## The River of Night

THE major's clenched fist was caught as it drove, by a scientific guard from the Master's right. The Master dropped his lamp, and with a straight left-hander sprawled Bohannan on the slimy pave. Impersonally he stood over the crazed Celt.

"Will you jump, voluntarily," demanded he, "or shall we be under the painful necessity of having to throw you down that pit?"

Enough rationality remained in the major to spur his pride. He crawled to his feet, chastened. "You win, sir," he answered. "Who goes first?"

A dull reverberation shuddered the rock, the air.

*"Vive Nissr!"* exulted Leclair. "Ah, now our men, they attack the city!"

"I'm sorry to disillusion you," the Master answered, "but my explosive produces an entirely different type of concussion. What we have just heard is the blowing-in of the treasure-crypt door. There's no time to lose, now. Who jumps, first?"

"Wait a minute!" cried "Captain Alden." Her eyes were gleaming through the mask, with keen excitement. "Why neglect any chance of possibly surviving?"

"What do you mean?" the Master demanded.

"Those wine-sacks!"

"Well?"

"Emptied, inflated and tied up again they'll float us! It's the oldest kind of device used in the Orient!"

"By Allah, inspiration! Quick, men, the wine-skins!"

Himself, he set the example. Knife in hand, while Emilio held the lamp for him, he crumbled the seals on one of the goat-skins, then cut the leather thong that secured the neck, and quickly unwound it. He dragged the sack to the black pit and tipped it up.

With a gulp and a gurgle, the precious old wine, clear ruby under the dim light, gushed away down the steaming shaft that plunged to the River of Night.

"Oh, faith now, but that's a damned shame, sir!" Bohannan protested, rubbing an ugly welt on his brow. His voice was thick, dull, unnatural. Madness glimmered in his blinking eyes. "With the blessed tongue of me parched to a cinder! And wine like that! Here, sir—take a handful of diamonds, or whatever, and give me just one little drink!"

"Bristol! Restrain that man!" the Master ordered. "If you can't handle him, get help!"

As a couple of legionaries laid hands on the major, another voice spoke up. It was Ferrara's:

"The major is right, sir, in spite of all! Good wine in our throats would make death less bitter. 'We who are about to die, salute thee'—and ask wine!"

The Master peered sharply from beneath black brows. Discipline seemed crumbling. Now at what might be, perhaps, the last minute of his command, was the Master's word to be made light of? Were his orders to be gainsaid?

"No wine!" he flung at all of them, his voice tense as wire. "Who says we are about to die? Why, there may a fighting chance, even yet! This underground river may come to light, somewhere. And if it does, it may bear us back to day, again.

"But the confusion of wine may just turn the scale against our getting through. No wine! We started

on that basis. That's the basis we're going through on. No wine, I say—*no wine!*"

Murmurs answered him, but no man dared rebel. Discipline still gripped the legionaries. The Master drove them to labor. "Come, quick now! Prepare a sack, apiece! I'll show you how!"

He set lips to the emptied skin, and with many lungfuls of strong breath inflated it. The leather thong tightly wrapped the neck. He doubled that neck over, and took more turns with the thong, then tied it in a tight square knot.

"Get to work, men!" he ordered. "To work!"

They obeyed. Even the major, brain-shaken as he was, fell in with the orders. The floor, all round the black pit, ran red with precious wine, a single cupful of which would have delighted the heart of the world's most Lucullian gourmet.

Up from that floor and from the jetty, steaming walls of the pit drifted ambrosial perfume that evoked visions of ancient vineyards where, under the Eastern sun, bloomy clusters of grape—mayhap even the very grape sung by the Tent-maker—hung ripening.

Still, none stooped to the mouths of the wine-skins, to taste. None drank from cupped palm. Dry-mouthed, panting, the legionaries still obeyed. And this the rare wine of Araby ran guttering to the unseen blackness of the mystery-river far below.

The Master, hands on hips, watched this labor; and as he watched he laughed.

"Whatever comes to us, men," judged he, "we are here and now doing great evil to the men of El Barr. My only regret is that we haven't time to return up through the labyrinth, to the jewel-crypt, fill the skins with jewels and dump them all down this shaft like the wine. These Moslem swine would then remember us, many a long day. Ah, well, some day we may come back—who knows?"

He fell silent, while the last of the skins were being filled and lashed. The last, that is to say, needed by the legionaries. Ten in all, were now blown up and securely tied. But a good many more still remained full of the rare wine.

With his scimitar, the Master slashed these quickly, one by one.

"They took our blood," he cried. "We have taken theirs—and their wine, too. And Myzab and the Black Stone, no doubt. Well, it's a bargain!"

*"C'est egal!"* exclaimed Leclair. "More than that, eh, *mon capitaine!*"

The Master returned to the shaft, his bare feet red through the run and welter of the wine on the stone floor.

"Now men," said he, crisply, as he flung down the pit his scimitar which could have no further use, "this may be the final chapter. Our Legion was organized for adventure. We've had it. No one can complain. If it's good-by, now—so be it.

"There may be a chance, however, of winning through. Hold fast to your goat-skins; and if the hidden river isn't too hot, and if there's head-room, some of us may get through to daylight. Let us try to reassemble where we find the first practicable stopping-place. If the Jannati Shahr men are waiting for us, there, don't be taken alive. Remember!

"Now, give me your hand, each one, and—down the shaft with you!"

Simonds went first, boldly, without a quiver of fear. Silently and with set jaw, he shook hands with the Master, clutched a distended wine-bag in both arms, and leaped.

His body vanished, instantly, from sight. Steam and darkness swallowed it. Far below, a dull splash told of his disappearance.

Lebon followed, after having given his torture-twisted hand to his beloved lieutenant, as well as to the Master.

*"Notre Père qui est aux cieux!"* he stammered, as the pit received him.

Then went Wallace, Ferrara and Emilio. Of these three, only the last showed anything resembling the white feather. Emilio's face was waxen, with staring eyes reflecting unspeakable horror, as he took the leap into the River of Night. But he went mutely, with no outcry.

Bristol, sheathed in imperturable British aplomb, remarked:

"Well, so long, boys! This is jolly beastly, eh? But we'll meet out on that beautiful shore!"

### Man and Woman

THEN he, too, jumped in the black.

Leclair, inappropriately enough, leaped with a shout of: *"Vive la France!"*

Now only Bohannan, "Captain Alden" and the Master were left.

"You're next, major!" the Master ordered, pointing at the inexorable black mouth of the pit, whence rose the thin, wraith-spirals of vapor.

"I'm ready!" exclaimed the major. "Sure, what's better than a hot bath after the heavy exercise we've been having?" His voice rose buoyantly over the drumming roar of the mysterious, underground torrent. "Ready, sir! But if you'll only give me one wee sup of good liquor, sir, I'll die like an Irishman and a gentleman—of fortune!"

"No liquor, major," the Master answered, shaking his head. "Can't you see for yourself all the wine-sacks are cut?"

"Cut, is it? Well, well, so they are!" The major blinked redly. Obviously his confused mind had not grasped the situation. "Well, sure, that's a pity, now." And he fell to gnawing that tawny mustache of his.

"Come major, you're next!" the Master bade him. "Take your wine-skin and jump!"

Clarity of mind for a moment returned to Bohanan. Gallantly he shook hands with the Master, saluted "Captain Alden," and picked up his wine-sack.

"It's a fine whirl we've had," he affirmed, with one of his old-time smiles, his teeth gleaming by the light of the silver lamp in the Master's hand. "No man could ask a better. I'd rather have seen what I've seen, and done what I've done, and now jump to hell and gone, than be safe and sound this minute on Broadway.

"Please overlook any little irregularities of conduct, sir. My brain, you know, and—well, good-by!"

Calmly he picked up his sack and without more ado jumped into the void.

"Now," said the Master, when "Captain Alden" and he remained alone. "Now—you and I!"

"Yes," the woman answered. "You and I, at last!"

The Master set down his lamp on the floor all wet with condensed vapor and wine. He loosened the buckles of her mask, took the mask off and tossed it into the pit.

"Finis, for *that!*" said he, and smiled strangely. "You aren't going to be handicapped by any mask, in whatever struggle lies ahead of us. If you get through to the world, and to life again, you get through as a woman.

"If not, you die as one. But the disguise is done

with, and gone. You understand me!"

"Yes, I understand," she answered, and stood peering up at him. Not even the white welts and ridges cut in her flesh by the long wearing of the mask could make her face anything but very beautiful. Her wonderful eyes mirrored far more, as they looked into this strange man's, than would be easy to write down in words.

"I understand," she repeated. "If this is death, I couldn't have dreamed or hoped for a better one. In that, at least, we can be eternally together—you and I!"

Silence fell, save for the shuddering roar of the black river, that rose with the vapors from the pit of darkness. Man and woman, they searched out each other's souls with their gaze.

Then all at once the Master took her hand, and brought it to his heart and held it there. The lamp-shine, obliquely striking upward from the floor, cast deep shadows over their faces; and these shadows seemed symbolic of the shadows of death closing about them at this hour of self-revelation.

"Listen," said the Master, in a wholly other voice from any that had ever come from his lips. "I am going to tell you something. At a moment like this, a man speaks only the exact truth. That is the exact truth.

"In all the years of my life and in all my wanderings up and down this world, I have never seen a woman—till now—whom I felt that I could love. I have lived like an anchorite, celled in absolute isolation from womankind. Incredible as it may seem to you, I have never even kissed a woman, with a kiss of love. But—I am going to kiss you, now."

He took her face in both his hands, drew it up for a moment gazed at it with a fixity of passion that seemed to burn. The woman's eyes drooped shut. Her lips yearned for this. His stern arms in-drew her to his breast, and for a moment she remained there, silently.

All at once he put her from him.

"Now, go!" he commanded. "I shall follow, close. And wait for me—if there is any waiting!"

He picked up one of the two remaining wine-sacks, and put it into her hands.

"Cling to this, through everything!" he commanded. "Cling, as you love life. Cling, as you share my hope for what may be, if life is granted us! And—the mercy-bullet, if it comes to that!

"Now—good-by!"

She smiled silently and was gone.

The Master, now all alone, stood waiting yet a moment. His face was bloodless. His lower lip was mangled, where his teeth had nearly met, through it.

Already, a confused murmur of sound was developing, from the black opening of the passage that had led the legionaries down to this crypt of the wine-sacks and the pit.

He smiled, oddly.

"Many a corpse has been flung down this oubliette," said he. "I hate to go, without emptying my pistol into a few more of the Moslem swine, and dropping them down here to join my people. But—I must!"

He bent, gathered together the silver lamps left by his men, and threw them all into the abyss. Blackness, absolute, blotted the reeking chamber from his sight.

The faintest possible aura of light began to loom from the mouth of the passage. More distinctly, now, the murmur of Arab voices was becoming audible.

Far below, at the bottom of the pit, sounded a final impact of some heavy body striking swift water that swept it instantly away.

Then silence filled the black, rock-hewn chamber in the labyrinthine depths of Jannati Shahr.

## CHAPTER XLIX

### The Desert

THE Desert.

Four men, one woman.

Save for these five living creatures, all was death. All was that great emptiness which the Arabs call *"La Siwa Hu"*—that is to say, the land "Where there is none but He."

Over terrible spaces, over immense hearkening silences of hard, unbroken dunes extending in haggard desolation to fantastic horizons of lurid ardor, hung a heat-quivering air of death-like stillness. Redder than blood, a blistering sun-ball was losing itself behind far, iron hills of black basalt. A flaming land it was, naked and bare, scalped and flayed to the very bones of its stark skeleton.

Heavily, and with the dazed look of beings who feel themselves lost yet still are driven by the life within them to press on, the five fugitives—pitiable handful of the Legion—were plodding southwest, toward the sunset.

The feet of all were cut and bleeding, in spite of rags torn from their tattered uniforms and bound on with strips of cloth; for everywhere through the sand projected ridges of vertical, sharp stone—the black basalt named by the Arabs *hajar Jehannum,* or "rock of hell." As for their uniforms, though now dry as bone, the way in which they were shrunken and wrinkled told that not long ago they had been drenched in water of strongly mordant qualities.

Each figure bore, on its bent back, a goatskin bag as heavily filled with water as could be carried. Strongly alkaline as that water was, corroding to the mouth and nauseous to the taste, still the refugees were clinging to it. For only this now stood between them and one of the most hideous deaths known to man—the death of thirst in the wilderness.

The woman's face, in spite of pain, anxiety, weariness, retained its beauty. Her heavy masses of hair, bound up with cloth strips, protected her head from "the great enemy," the sun. As for the others, they had improvised rough headgear from their torn shirts, ingeniously tied into some semblance of cherchias. Above all, the legionaries knew that they must guard their heads from the direct rays of the desert sun.

In silence, all plodded on, on, toward the bleeding sphere that, now oblate through flaming mists, was mercifully sinking to rest. No look of surprise marked the face of any man, that "Captain Alden" was in reality a woman. The legionaries' anguish, the numbing, brutalizing effects of their recent experience had been too great for any minor emotions to endure. They had accepted this fact like all others, as one of a series of incredible things that had, none the less, been true.

For a certain time the remnant of the Legion dragged itself southwestward, panting, gasping, wasting no breath in speech. Leclair was first to utter words.

"Let us rest a little while, my captain," said he in a hoarse, choking voice. "Rest, and drink again. I know the desert. Many hundreds of miles lie between us and the coast. Nothing can be gained by hastening, at first. All may be lost. Let us rest, at all events, until that cursed sun has set!"

In silence the Master cast down his water-bag, at the bottom of the little, desolate valley of gravel through which the fugitives were now toiling. All did the same, and all sat down—or rather, fell—upon the hot earth.

Very different, now, this land was from what it had seemed as they had soared above it, at cool altitudes, in

the giant air-liner; very different from the cool, green plain of El Barr, behind the grim black line of the Iron Mountains now a dim line off to eastward.

The sprawling collapse of the legionaries told more eloquently than any words the exhaustion that already, after only four hours' trek, was strangling the life out of them.

For a while they lay there motionless, unthinking, brutalized by fatigue and pain. With their present condition as an earnest of what was yet to come, what hope had any that even one of them would live to behold the sparkle of the distant Red Sea? Even though unmolested by pursuit from Jannati Shahr or by attack from any wandering tribes of the Black Tent people, what hope could there be?

### A Caravan!

GRADUALLY some coherence of thought returned to the Master. He sat up, painfully, and blinked with reddened eyes at the woman. She was lying beside her water-bag, seemingly asleep. The Master's face drew into lines of anguish as he looked at her.

With bruised fingers he loosened the thong of his own water-bag, and tore still another strip from his remnant of shirt. He poured a little of the precious water on to this rag, lashed the water-sack tight again, and with the warm, wet rag bathed the woman's face, brow and throat.

Her closed lids did not open. No one paid any attention. No one even stirred. The cloth grew dry, almost at once, as the thirsty air absorbed its moisture. The Master pocketed it. Elbows on knees, head between hands, he sat there pondering.

In thought he was living over again the incredible events of the past hours, as they had been presented to his own experience. He was remembering the frightful, dizzying plunge down the black pit into the steaming waters of the River of Night—waters which, had they been but a few degrees hotter, would incontinently have ended everything on the instant.

He was recalling, as in a nightmare, his frenzied battle for life, clinging to the inflated goat-skin—the whirl and thunder of unseen cataracts in the blind dark—the confusion of deafening, incomprehensible violences.

He was bringing back to mind the long, swift, smooth rushing of mighty waters through midnight caverns where echoes had told of a rock-roof close above; then, after an indeterminate time of horror that might have been minutes or hours, a weltering maelstrom of leaping waters—a graying of light on swift-fleeing walls; a sudden up-boiling gush of the strangling flood that whelmed him—and all at once a glare of sun, a river broadening out through palm-groves far beyond the Iron Mountains.

All these things, blurred, unreal, heart-shaking as evil visions of fever, the Master was remembering. Then came other happenings: a long drift with resistless currents, the strange phenomenon of the lessening stream that dwindled as thirsty sands absorbed it, and the ceasing of the palms.

Last of all, the river had diminished to a shallow, tortuous delta, where the Master's numbed feet had touched bottom. There he had dragged himself ashore, with his goat-skin, far more dead than living. And there, for a time he knew not, consciousness had wholly ceased.

A dull, toneless voice sounded in the Master's ears. Bohannan was speaking.

"Faith, but it's strange how even the five of us found each other, out there in the sand," said the major. "What happened to the rest of us, God knows—maybe!" He choked, coughed, added: "Or to the boys with Nissr. God rest their souls! I wish I had a sackful of that wine!" After a long pause: "Don't you, now? What?"

The Master gave no heed. He was trying to ease the position in which the woman was lying. His jacket was off, now, and he was folding it to put under her head.

At his touch, she opened vague eyes. She smiled with dry lips, and put his hand away.

"No, no!" she protested. "No special favors for me! I'm not a woman, remember. I'm 'Captain Alden,' still—only a legionary!"

"But—"

"If you favor me in any way, to the detriment of any of the others or your own, I won't go on! I'm just one of you. Just one of the survivors, on even terms with the rest. It's give-and-take. I mean that! You've got to understand me!"

The Master nodded. He knew that tone. Silently he put on his jacket, again.

The lieutenant's orderly, Lebon, groaned and muttered a prayer to the Virgin, Leclair sat up, heavily, and blinked with sand-inflamed eyes.

"Time to drink again, *n'est-ce pas*, my captain?" asked he. "Drink to the dead!"

"I hope they *are* dead, rather than prisoners!" exclaimed the Master. "Yes, we'll drink, and get forward. We've got to make long strides, to-night. Those Jannati Shahr devils may be after us, to-morrow. Surely will, if they investigate that delta and find only a few bodies. They'll conclude some of us have got through. And if they pick up our trail, with those white dromedaries of theirs—"

"The sacred pigs!" ejaculated Leclair. "Ah, *messieurs*, now you begin to know the Arabs as I have known them." With eyes of hate and pain he peered back at the darkening line of the Iron Mountains.

Bohannan, already loosening the neck of his goat-skin, laughed hoarsely.

"No wine!" he croaked, "and the water's rationed; even the stinking water. But the food isn't—good reason, too; there isn't any. Pockets full of gems!" He slapped one hard pocket. "I'd swap the lot for a proper pair of shoes and a skin o' that wine! Faith—that wine, now—"

The woman suddenly sat up, too, one hand on the hot gravel, the other raised for silence.

"Hark!" she whispered. "Sh!"

"What now?" demanded the Master.

"Bells! Camel-bells!"

*"Nom d'un nom!"* the lieutenant exclaimed, as he drew his gun.

The five fugitives stiffened for another battle. They looked well to their weapons. The Master's weariness and pain were forgotten as he crawled on hands and knees up the side of the little wady. The sound of distant camel-bells, a thin, far quiver of sound, had now reached his ears and those of the other men, less sensitive than the woman's.

Over the edge of the wady he peered, across a *wa'ar* or stony ground covered with mummified scrub. Beyond, a blanched salt-plain gleamed hoar-white in the on-coming dusk; and farther off, the dunes began again.

Strangely enough, the Master laughed. He turned and beckoned, silently. The others joined him.

"From the west!" he whispered. "This is no pursuit! It is a caravan going to Jannati Shahr!"

Bohannan chuckled, and patted his revolver. "Faith but Allah is being good to us!" he muttered. "Now, when it comes to a fight—"

"Ten dromedaries—no, nine—" Leclair judged.

"And six camel-drivers," put in the woman, gun in hand. "A small caravan!"

"Hold your fire, all!" commanded the Master. "They're headed right across this wady. Wait till I give the word; then rush them! And—no prisoners!"

## CHAPTER L

### "Where There Is None But Allah"

AN hour after sundown, four legionaries pushed westward, driving the gaunt, mange-stained camels. In the sand near the wady lay buried Leclair and all the camel-drivers, with the sand smoothed over them so as to leave as little trace as possible.

Leclair had come to the death of all deaths he would have most abominated, death by ruse at the hands of an Arab. Not all his long experience with Arabs had prevented him from bending over a dead camel-driver. The dead man had suddenly revived from his feigned death and driven a *jambiyeh* into the base of the lieutenant's throat. That the lieutenant's orderly had instantly shattered the cameleer's skull with a point-blank shot had not saved Leclair.

The four survivors, in addition to burying all the bodies, had buried the copper bars the caravan had been freighting to Jannati Shahr. They had saved the scant food and water of the drivers, also their clothing, slippers, daggers, long rifles, and ammunition.

Now, dressed like Arabs—the best of all disguises in case of being sighted by pursuers or by wandering Black Tent tribes, from far off—they were trekking westward again, riding four of the camels and leading the others.

For a week of hell the failling beasts, already half-dead of thirst when captured, bore them steadily southwest, toward the coast. Twice there rose spirals of smoke, in the desert distances; but, whether these were from El Barr pursurers or were merely Bedouin encampments they could not tell. Merciless goading kept the camels going till they dropped dead, one by one.

By the end of the fourth day only three remained. Lebon methodically cut up every one that perished, for water, but found none in any stomach.

The fugitives sighted no oasis. They found no wady other than stone-dry. By day they slept, by night pushed forward. Day by day they grew weaker and less rational. The increasing nerve-strain that possessed them was companioned by the excruciating torture of their bodies racked by the swaying jolt of camel-riding.

But they still kept organization and coherence. Still, guided by the stars that burned with ardent trembling in the black sky, they followed their chosen course.

Morning heat-mist, noontide glare, wind like a beast with flaming breath, a sky terrible in its stainless beauty, an inescapable sun-furnace that seemed to boil the brains in their skulls—all these and the mockery of mirages that made every long white line of salt-efflorescence a lake of cooling waters, brought the four tortured legionaries close to death.

Awaking toward evening of the fifth day, the Master discovered one of the three camels gone—the one on which he had been riding with the woman, lest she fall fainting to the sand. With this camel, Major Bohannan had likewise disappeared. His big-shouldered, now emaciated figure in its dirty-white burnoose was nowhere visible. Only prints of soft-hoof-pads, leading off to northeastward, betrayed the line of flight.

The Master pondered a while as he sat there, dazed, blinking at the desert all purple, gold, and tawny-red. His inflamed eyes, stubby beard and gaunt cheeks made him a caricature of the man he had been, ten days before. After a little consideration, he awakened the woman and Lebon.

The verdict of Bohannan was madness, mirage, desertion. For two days the major had been babbling of wine and water, been beholding things that were not, been hurling jewels at imaginary vultures. Now, well, the desert had got him.

To pursue would have been insanity. They got the two remaining camels up, by dint of furious beating and of hoarse eloquence in Arabic from the Master and Lebon. Once more, knowing themselves doomed, they pushed into the eye of the flaming west, over the savage gorgeousness of the Empty Abodes. In less than an hour the double-laden camel fell to its knees and incontinently died.

Lebon dismounted from the one surviving animal, and stepped fair into a scorpion's nest. The horrible little gray creature, striking up over its back with spiked tail, drove the deadly barb half an inch into the orderly's naked ankle.

The Master scarified, sucked, and cauterized the wound. Nothing availed. Lebon in his depleted condition could not fight off the poison. Thirty minutes later, swollen and black, he died in a frothing spasm, his last words a hideous imprecation on the Arabs who had enslaved and tortured him—a curse on the whole race of Moslems.

Shaken with horror, the woman and the man buried Lebon, loaded the remaining water-bags, the guns and food onto the one camel and dragged themselves away on foot, driving the spent beast. Obviously this camel could not go far. Blindness had stricken it, and its black lips were retracted with the parch of thirst.

They gave it a half a skin of water, and goaded it along with desperation. Everything now depended on this camel. Even though it could not carry them, it could bear the burden of their scant supplies. Without it, every hope was lost.

All that night they drove the tortured camel. It fell more and more often. The Master spared it not. For on its dying strength depended the life of the woman he loved.

The camel died an hour before dawn. Not even vultures wheeled across the steely sky. The Master cut from its wasted flanks a few strips of meat and packed them into one of the palm-stick baskets that had held the cameleers' supplies. With them he packed all the remaining food—a few lentils, a little goat's milk cheese, and a handful of dates fried in clarified butter.

This basket, with a revolver and a handful of cartridges, also the extra slippers taken from Leclair and the orderly, made all the burden the woman could carry. The Master's load, heavier far, was one of the water-skins.

This load, he knew, would rapidly lighten. As it should diminish, faster than the woman's, he would take part of hers. Thus, as best they could, they planned the final stage of their long agony.

Before starting again, they sat a while beside the gaunt, mangled camel, held council of war and pledged faith again. They drank a little of the mordant water that burned the throat and seemed in no wise to relieve the horrible thirst that blackened their lips and

shriveled all their tissues.

"I think," the Master gasped, "we can make an hour or two before the sun gets too bad." He squinted at the crimson and purple banderoles of cloud through which, like the eye of a fevered Cyclops, the sun was already glowering. Already the range of obsidian hills ahead of them, the drifted sands all fretted with wind-waves, the whole iron plain of the desert was quivering with heat. "Every hour counts, now. Before we start, let us agree to certain things."

She nodded silently, crouching beside him on the sand. He drew an emaciated arm about her and for a moment peered down into her face. But he did not kiss her. A kiss, as they both were—some fine delicacy of the soul seemed telling him—would have been mockery.

"Listen," he commanded. "We must strictly ration the food and water. You must help me keep to that ration. I will help you. We must be careful about scorpions. Above all, we must beware of mirages. You understand?"

"I understand," she whispered.

"If either of us sees palms or water, that one must immediately tell the other. Then, if the other does not also see them, that is a mirage. We must not turn aside for anything like that, unless we *both* see it. I am speaking rationally, now that I can. Remember what I say!"

Silently she nodded. He went on:

"Now that we can still think, we must weigh every contingency. Our only hope lies in our helping each other. Alone, either of us will be led away by mirages in a little while. That kind of death must be spared us. We both live or die, together."

She smiled faintly, with parched lips.

"Do you think I would leave you," she asked, "any more than you would leave me? The pact is binding."

He pressed her hand.

"Come," said he. "Let us go!"

Once more they got to their feet, and set out to southwestward, over a scorching plain of crumbling, nitrous mud-flakes. Laden as they were, they could barely shuffle one foot after the other. But blessed lapses of consciousness now and then, relieved their agony.

Conscious or not, the life within them drove them onward, ever onward; slow, crawling things that all but blindly moved across the land of death, *La Siwa Hu*—"where there was none but God."

## CHAPTER LI
### Torture

HOW that day passed, they knew not. Nature is kind. When agony grows too keen, the All-mother veils the tortured body with oblivion.

Over blood-covered stretches swept by the volcano-breath of the desert, through acacia-barrens and across basaltic ridges the two lonely figures struggled on and on. They fell, rested, slept a nightmare sleep under the furious heat, got up again and dragged themselves once more along.

Now they were conscious of plains all whitened with saltpeter, now of scudding sand-pillars—wind-jinnee of the Empty Abodes—that danced and mocked them. Again, one or the other beheld paradisiacal, gleaming lakes, afar.

But though they had lost the complete rationality that would have bidden them lie quiet all day, and trek only at night, they still remembered the pact of the mirages. And since never both beheld the same lake, they held each other from the fatal madness that had lured Bohannan.

Their only speech was when discussing the allurements of beckoning waters which were but air.

At nightfall, toiling up over the lip of a parched, chalky nullah that sunset turned to amethyst, a swarm of howling Arabs suddenly attacked them. The Master flung himself down, and fired away all his ammunition, in frenzy. The woman, catching his contagion, did likewise.

No shots came back; and suddenly the Arabs vanished from the man's sight. When he stumbled forward to the place where they had been, he discovered no dead bodies, not even a footprint.

Nothing was there but a clump of acacias, their twisted thorns parched white. They had been shooting at only fantasms of their own brains. Now, even the mercy-bullets were gone.

Bitterly the man cursed himself, as he thrust the now useless pistol back into its holster. The woman, however, smiled with dry lips, and from her belt took out a little flattened piece of lead—the bullet which, fired at Nissr from near the Ka'aba, had fallen at her feet and been picked up by her as a souvenir.

"Here is a bullet," said she chokingly. "You can cut this in two and shape it. We can reload two shells with some of the Arab powder. It will do!"

They laughed irrationally. More than half mad as they now were, neither one thought of the fact that they had no percussion caps.

Still laughing, they sat down in the hot sand, near the claw-like distortions of the acacias. Consciousness lapsed. They slept. The sun's anger faded; and a steel moon, long after, slid up the sky.

Next day, many miles to southwestward of the acacias, Kismet—toying with them for its own delectation—respited them a little while by stumbling them onto a deserted oasis. They turned aside to this only after a long, irrational discussion. The fact that they could both see the same thing, and that they had really come to palm-trees—trees they could touch and feel—gave them fresh courage.

Little enough else they got there. The cursed place, just a huddle of blind, mud huts under a dozen sickly trees, had been swept clean some time ago by the passage of a swarm of those voracious locusts known as *jarad Iblis*, the locusts of Satan.

Nothing but bare branches remained in the *nakhil*, or grove. Nothing at all was to be found in the few scrubby fields about the well now choked with masses of the insects. Whoever the people of this squalid settlement had been, all were gone. The place was almost as bare as if the sun's flames had themselves flared down and licked the village.

All the sufferers found, of any worth, was a few handfuls of dry dates in one of the hovels and a water-jar with about two quarts of brackish water.

This water the Master discovered, groping half blind through the hut. Stale as it was, it far surpassed the strongly chemicalized water of the River of Night, still remaining in the goat-skin. It smote him with the most horrible temptation of his life. All the animal in his nature, every parched atom of his body shouted:

"Take it! Drink, drink your fill! She will never know. Take it, and drink!"

He seized the water-jar, indeed, but only to carry it with shaking hands to her, where she lay in the welcome shadow of the hut. His lips were black with thirst as he raised her head and cried to her:

"Here is water—real water! Drink!"

She obeyed, hardly more than half-conscious. He gave her all he dared, having her drink at once, nearly half. Then he set down the jar, loosened the sack from his shoulders which were cut raw with the chafing of the thongs, and bathed her face with a little of that other water which, though bad, still might keep life in them.

"This may be an insane waste," he was thinking, "but it will help revive her. And—maybe—we shall find another, better oasis."

Out across the plain he peered, over the sun-dried earth, out into the distances shrouded with purple mists. His blurred eyes narrowed.

"Why, my God! There's one, now!" he muttered. "A green one—cool—fresh—"

The Master laid the woman down again in the shadow, got up and staggered out into the blinding sun. He tottered forward, laughing hoarsely.

*"Cool—fresh—"* The words came from between parched lips.

All at once the oasis faded to a blur in the brilliant tapestry of the desert that beckoned. "Come to me—and die!"

The Master recoiled, hands over eyes, mouthing unintelligible words. Back, beside the woman he crouched, fighting his own soul to keep it from madness. Then he heard her voice, weak, strange:

"Have you drunk, too?"

"Of course!"

"You are not—telling me the truth."

"So help me God!" His fevered lips could hardly form the words. "There, in the hut—I drank. All I needed."

She grew silent. Consciousness lapsed. They lay as if dead, till almost evening, under the shelter of the blessed shadow.

The rest, even in that desolation, put fresh life into them. At nightfall they bound up their feet again, ate the dry dates and a little of the cheese, and once more set their blistered faces toward the Red Sea.

The woman's basket was not light, indeed, across her shoulders. Not all her begging had induced the Master to let her carry the water-jug there. This, too, he was carrying.

All night long, stopping only when one or the other fell, they ploughed over basalt and hornblende schist that lacerated their feet, over blanched immensities under the steel moon, across grim black ridges and through a basin of clay circled by hills.

Strange apparitions mocked and mowed before them, but grimly they gave no heed. This, they both realized in moments of lucidity, was the last trek. Either they must find the sea, before another night, or madness would sink its fangs into their brains. And madness meant—the end.

Their whole consciousness was pain. This pain localized itself especially in their heads, round which some jinnee of the waste had riveted red-hot iron bands. There was other pain, too, in the limping feet cased in the last of the babooches, now stiffened with blood. And in the throat and lungs, what was this burning?

## CHAPTER LII

### "Thalassa! Thalassa!"

ANOTHER of those terrible, red mornings, with a brass circle of horizon flaming all around in the most extraordinary fireworks topped by an azure zenith, found them still crawling southwestward, making perhaps a mile an hour.

Disjointed words and sentences kept framing themselves in the man's mind; above all, a sentence he had read long ago in Greek, somewhere. Where had he read that? Oh, in Xenophon, of course. In *"The Retreat of the Ten Thousand."* The Master gulped it aloud, in a dead voice:

"Most terrible of all is—the desert—for it is full—of a great want."

After a while he knew that he was trying to laugh.

"A great want!" he repeated. "A great—"

Presently it was night again.

The Master's mind cleared. Yes, there was the woman, lying in the sand near him. But where was the date-stick basket? Where was the last of the food? He tried to think.

He could remember nothing. But reason told him they must have eaten the last of the food and thrown the basket away. His shoulders felt strangely light. What was this? The water-bag was gone, too?

But that did not matter. There had been only a little of that chemicalized water left, anyhow. Perhaps they had drunk it all, or bathed their faces and necks with it. Who could tell? The water-sack was gone; that was all he knew.

A great fear stabbed him. The water-jar! Was that still on his back? As he felt the pull of a thong, and dragged the jar around so that he could blink at it, a wonderful relief for a moment deadened his pain.

*"Allah iselmak!"* he croaked, blessing the scant water the jar still held. He realized the woman was peering at him.

"Water!" he whispered. "Let us drink again—and go on!"

She nodded silently. He loosed the thong, took the jar and peered into its neck, gauging the small amount of water still there. Then he held it to her lips.

She seemed to be drinking, but only seemed. Frowning, as she finished, he once more squinted into the jar with bleared eyes. His voice was even, dull, ominous as he accused:

"You drank nothing. You are trying to save water for me!"

She shook her head in negation, but he penetrated the lie. His teeth gleamed through his stubble of beard, and his eyes glinted redly under the hood of his ragged burnoose as he cried:

"Will you drink?"

"I tell you—I have drunk!"

Slowly he tilted the jar toward the thirsty sands.

"Drink, now, or I pour all this on the ground!"

Beaten, she extended a quivering hand. They shared the last of the water. The man took less than a third. Then they set out again on the endless road of pain.

Was it that same day, or the next, that the man fell and could not rise again? The woman did not know. Something had got into her brain and was dancing there and would not stop; something blent of sun and glare, sand, mirage, torturing thirst. There was a little gray scorpion, too—but no, *that* had been crushed to a pulp by the man's heel. Or had it not? Well—

The man! Was there a man? Where was he? Here, of course, on the baked earth.

As she cradled his head up into her lap and drew the shelter of her burnoose over it, she became rational again. Her hot, dry hand caressed his face. After a while he was blinking up at her.

"Bara Miyan! Violator of the salt!" he croked, and struck at her feebly. And after another time, she perceived that they were staggering on and on once more.

The woman wondered what had happened to her

head, now that the sun had bored quite through. Surely that must make a difference, must it not?

A jackal barked. But this, they knew, must be illusion. No jackals lived so far from any habitation of mankind. The man blinked into the glare, across which sand-devils of whirlwinds were once more gyrating over a whiteness ending in dunes that seemed to be peppered with camel-grass.

Another mirage! Grass could grow only near the coast. And now that they had both been tortured to death by Jannati Shahr men and been flung into Jehannum, how could there be any coast? It seemed so preposterous.

It was all so very simple that the man laughed—silently.

Where had that woman gone to? Why, he thought there surely had been a woman with him. But now he stood all alone. This was very strange.

"I must remember to ask them if there wasn't a woman," thought he. "This is an extraordinary place! People come and go in such a manner."

The man felt a dull irritation, and smeared the sand out of his eye. How had that sand got there? Naturally, from having lain on one of those dunes. There seemed to be no particular reason for lying on a dune, under the fire-box of an engine, so the man sat up and kept blinking and rubbing his eyes.

"This is the best mirage, yet," he reflected. "The palms look real. And the water—it sparkles. Those white blotches—one would say they were houses!"

Indifferent, yet interested, too, in the appearance of reality, the man remained sitting on the dune, squinting from under his torn burnoose.

The mirage took form as a line of dazzling white houses along a sea of cobalt and indigo. And to add to the reality of the mirage, some miles away, he could see two boats with sails all green and blue from the reflection of the luster of the water.

The man's eyes fell. He studied his feet. They were naked, now, cut to the bone, caked with blood and sand. Odd, that they did not hurt. Where were his babooches? He seemed to remember something about having taken some ragged ones from the feet of some woman or other, a very long time ago, and having bound his own upon her feet.

"I'll ask the people in those houses, down there," thought he; and on hands and knees started to crawl down the slope of the dunes toward the dazzling white things that looked like houses.

Something echoed at the back of his brain:

*"You must ask her if this is real! Unless you both see it, you must not go!"*

He paused. "There *was* a woman, then!" he gasped. "But—where is she now?"

Realization that she had disappeared sobered him. He got up, groped with emaciated hands before his face as he turned back away from the white houses and stumbled eastward.

All at once he saw something white lying on the sand, under a cooking glare of sunlight. Memory returned. He fell on his knees beside the woman and caught her up in quivering arms.

After a while, he noticed there was blood on her left arm. Blood, in the bend of the elbow, coagulated there.

This puzzled him. All he could think was that she might have cut herself on her *jambiyeh* dagger, when she had fallen. He did not know then, nor did he ever know, that he himself had fallen at this spot; that she had thought him dying; that she had tried to cut her arm and give him her blood to drink; that she had fainted in the effort. Some last remnants of strength welled up in him. He stooped, got her across his shoulder, struggled to his feet and went staggering up the dune.

Here he paused, swaying drunkenly.

Strange! The very same mirage presented itself to his eyes—blue sails, turquoise sea, feathery palms, white houses.

"By God!" he croaked. "Mirages—they don't last, this way! That's real—that's real water, by the living God!"

Up from dark profundities of tortured memory arose the cry of Xenophon's bold Greeks when, after their long torment, they had of a sudden fronted blue water. At sight of the little British consular station of Batn el Hayil, on the Gulf of Farsan:

*"Thálassa!"* he cried. *"Thálassā, thálassa* (The sea, the sea!"

## CHAPTER LIII
## The Greater Treasure

NEW YORK, months later.

Spring had long departed—the spring of the year in which the Eagle of the Air had flung itself aloft from the Palisades, freighted with such vast hopes.

Summer was past and gone. The sparkling wine of autumn had already begun to bubble in the cup of the year.

Sunset, as when this tale began. Sunset, bronzing the observatory of Niss'rosh, on top of the huge sky-scraper. Two of the legionaries—a woman and a man—were watching that sunset from the western windows of that room where first had been conceived the wonder-flight which had spelled death for so many a stout heart.

You could see great changes had come upon the man, as he paced slowly up and down the singular room, hands deep in the pockets of his riding-trousers. His hair was grayer, for one thing, his face leaner; a certain sinewy strength had come to him that had not been there before.

Some marks of suffering still remained on him, that not all of life could take away. His eyes looked deeper and more wise, his mouth more human in its smile. That he had learned to smile, at all, meant much. And the look in his eyes, as he glanced at the woman, meant vastly more. Yes, this man had learned infinitely much.

From a big bamboo Chinese chair the woman was watching him.

Her eyes were musing, reminiscent. Her riding costume well became her; and by the flush on her cheek you might have guessed they had both just come in from a long gallop together.

The costume gave her a kind of boyish charm; yet she remained entirely feminine. A kind of bronze mist seemed to envelop her head, as the dull-tawny sunset light fell on her from those broad windows. Near her riding-crop stood a Hindu incense-holder, with joss-sticks burning. As she took one of these and twirled it contemplatively, the blue-gray vapor spiralling upward was no more dreamy than her eyes.

"The invincible Orient!" she said, all at once. "It absorbs everything and gives back nothing. And we thought, we hoped, we might conquer part of it! Well—no—that's not done."

The man stopped his slow pacing, sat on the edge of the table and drummed with his fingers on the teak.

"Not at the first attempt, anyhow," said he, after a

little thought. "I think, though, another time—but there's no use dreaming. Of course, it's not the treasure I'm thinking about. That was just a detail. It's the men. Good men!"

She peered into the incense-smoke, as if exercising the powers of darkness.

"They're not dead, not all of them!" she exclaimed with conviction.

"I wish I could believe you!"

"But you *must* believe me! Something tells me some of our good chaps are still alive. All of them perhaps."

"Impossible!" He shook his head. "Even if they escaped the explosion, the Jannati Shahr devils must have massacred them." He shuddered slightly. "That's the worst of it. Death is all right. But the crucifixion, and all—"

"Cold reason paints a cruel picture, I know," the woman answered, laying a hand on the man's. "But you know—a woman's intuition. I don't believe as you do. And the major—and that rumor we got from old Nasr el Din, the Hejaz rug-merchant down on Hester Street, how about that?"

"Yes, I know. But—"

"How could a rumor like that come through, about a big, white-skinned, red-haired Ajam slave held by that tribe near Jeddah? How could it, unless there were some truth back of it?"

"He wandered away into the desert, quite insane. It's not impossible he might have been captured. By Allah!" And the man struck the table hard. "If I really believed Nasr el Din—"

"Well?"

"I'd go again, if I died for it!"

"The pronoun's wrong. *We'd* go!"

"Yes, *we!*" He took her hand. "We'd trail that rumor down and have Bohannan out of there, and the others too, if—but no, no, the thing's impossible!"

"Nothing is impossible, I tell you, in the East. And haven't we had miracles enough? After we were judged pirates and condemned to die, by the International Aero Tribunal, wasn't it a miracle about that pardon? That immunity, for your vibratory secrets that have revolutionized the defensive tactics of the League's air-forces?"

She smiled up at him, through the vapor. "It's the impossible that happens, these days! The soul within me tells me some of our chaps are still alive, out there!"

She waved the smoky wand toward the large-scale map of Arabia on the wall.

"But Rrisa," said she. "About the others, there's no sense of guilt. I feel, though, like a murderer about Rrisa."

"Rrisa still lives!"

He shook his head. "The incense tells me. My heart tells me!"

"Allah make it so! But even if he is dead, he died like the others—a man!"

"In pursuit of an ideal."

"Yes. It wasn't the treasure, of course," he mused. "It wasn't material things. It was adventure. Well—you and I have had that, at all events. And they had it too. They and we—all of us—we changed the course of history for more than two hundred million human beings. And as for you and me—"

He turned, peering at the map. Then he got up from the table, went to that map and laid a hand on the vast, blank expanse across which was printed only "Ruba el Khali"—the Empty Abodes.

"It would wreck the whole structure of civilization if we told," said he. The woman put back the incense-stick into its holder, got up and came to stand beside him. "Imagine the horrible, vulturelike scramble of capitalism to exploit that dyke of gold! There'd be expeditions, pools, combines, wars—we'd have the blood of uncounted thousands on our heads!

"It's not the treacherous El Barr people I'm thinking of. If they perished, as they would to the last man defending their gold, all well and good. But in case any of our men are still alive there, *they'd* be butchered. And then, the destruction of gold as a medium of exchange, by its gross plenty, would wreck the world with panics. And the greatest catastrophe of history would lie on our shoulders. That is why—"

"Why the secret must remain here," she said, touching her breast.

"This secret is ours," said he. "I have another, that even you don't know!"

He thrust a hand into his breast-pocket and brought out a small leather sack. Startled, she peered at it as he drew open the cord. He took from the sack a wondrous thing, luminous with nacreous hues.

"The Great Pearl Star," she cried.

"Yes, the Great Pearl Star, itself!"

She looked in silence. Then she reached out a hand and touched it, as if unbelieving.

"Why, you never told me!"

"I had a reason."

"And—through all that inferno, when every ounce had to be considered—"

"I was keeping this for—you."

There were tears in her eyes as he laid a hand on her shoulder.

"For you," he repeated. "It was mine, but it is mine no longer. This crown-jewel of Islam is yours, now—if you will have it."

"If I will have it!" she whispered. "There's only one thing in this whole world I more dearly long for!"

"I am offering you that, too," said the man, in a trembling voice. "I knew nothing of it, nothing whatever, until I came to understand what a woman really could be. I fought against it—and lost.

"It came to me not sought after and welcomed, but storming over the ramparts of my soul. Yes, I fought love—and lost."

"I understand that, too," she said.

"I put the Pearl Star in my breast, sacred to you. I said to myself, 'If we ever live through this, and I feel worthy to give this gem to her, I'll ask her to complete it.'"

"To complete it?"

"Yes. You see, one pearl was missing. The most wonderful of all. Now, as I clasp this necklace round your throat, the Pearl Star is completed."

"I—don't understand—"

"Ah, but I do! The missing pearl of great price—you are that pearl. In giving the Pearl Star to you, I make it whole."

"And I give it back to you, completed!"

Her head lay on his heart. His lips were on her hair.

"Completion," he whispered. "Peace, to the troubled heart. Peace, after the night that life has been to me. Peace, till the dawn!"

"'Peace,'" she said, in the line of the ancient Arabic poem. "'Peace, until the coming of the stars.'"

"'Peace,'" he breathed. "'It is peace until the rising of the day!'"

THE END.

Showing Lieutenant Apollo Soucek, U. S. N., beside his *Apache* bi-plane. This picture was taken just before Lieutenant Soucek ascended to break the world's altitude record.

# How High Can Man Fly?

*By*

LIEUTENANT APOLLO SOUCEK

*U. S. N. Who Recently Broke the World's Altitude Record, as told to* WALTER RALEIGH

*WE take great pleasure in presenting this article by Lieutenant Apollo Soucek, one of America's finest aviators and a recent holder of the world's altitude record.*

*There are few people who are better fitted to answer the question "How High Can Man Fly?" And in this very illuminating article, Lieutenant Soucek gives us his opinion on the question based on his great wealth of experience. We must all agree that he is very conservative in his estimates as to the ultimate height that man can reach with present equipment, and there is no doubt he feels as we do; that it is only a question of improving on the equipment, in order to reach heights hitherto deemed impossible.*

WHEN a meteor falls through our atmosphere, it attains such a tremendous speed that it becomes incandescent and often burns to a cinder before striking the earth. As we well know, this is caused by the friction of the air particles as they resist the movement of the body in its headlong flight toward the earth.

It seems strange that the air, which is so soft, could rub the meteor strenuously enough to heat it; yet such is the case: the visitor, coming from some infinite distance at untold speed, begins to heat as soon as it enters the earth's atmosphere, becomes red hot as the density of the air becomes greater, and finally burns itself up with the white heat.

Nearly everyone has seen these meteors fall and has marveled at the beauty of them. But falling stars have a more important function than fascination for the spectator: they enable the astronomer to measure the height, or perhaps I should say "thickness," of the atmospheric envelope surrounding the earth. As soon as the scientist can see the burning rock, he can tell how high it is, and determines readily enough that the upper limit of air is equal to the height of the meteor.

It is not possible for an aviator to reach the limit of our atmosphere, which is about 120 miles. In fact no one has yet exceeded eight miles. It is doubtful if present-type airplanes will reach anything like 120 miles above the earth, for although there is air at that altitude it is not of sufficient density to support a definite weight. Some fruit trees are thirty feet high, but a boy can climb only part way to the top—he cannot get the apples on the topmost branches, for they are too slender to sustain even a child's weight.

There is some reasonable height, however, that one can reach in an airplane or balloon. According to Lieutenant Charles McGuire, expert aerologist in the U. S. Navy, Bureau of Aeronautics, the small sounding balloons with no weights attached have been measured twenty-four miles above sea level. This is astounding, but gives an idea as to what the practical "ceiling" may be

## The Hazard of Breathing

THE possibilities of ascending twenty-four miles in an airplane are so remote as to scarcely exist at all, for there are too many obstacles in the vertical path. The first hazard

that man encounters is the inability to breathe at high altitudes, that is, to get oxygen into his system. One cannot inhale enough air at 25,000 feet—nearly five miles—to keep him alive; consequently flasks of oxygen must be carried to supply that most necessary element to the lungs.

In the Navy's *Apache*, the altitude airplane, we had three flasks, two of which were used as a steady supply and one was held in reserve in case of emergency, such as a broken tube, frozen mouthpiece, or damaged valve. The two service flasks supplied gas to a regulating valve, such as a welder uses with his oxy-acetylene torch, and from there was led through the flowmeter to the mouthpiece. The flowmeter is a device to let the pilot see how much oxygen he is using; it could be eliminated, as one feeds the gas according to the way one feels; it is retained, however, as it will show a stoppage in the flow sooner than can be detected otherwise. The third flask, called "the emergency," flows straight to a cut-off valve, which the pilot opens whenever he needs a large quantity at once. After the gas from any flask passes its control valve, it goes through rubber tubing to the mouthpiece. This part is fitted also with an exhaust tube through which the breath is expelled.

In the flights I made, all parts of the breathing equipment acted well. I plugged both nostrils in order that I should be forced to breathe entirely through my mouth; as good a purpose would have been served had I been able to breathe the oxygen through my nose. It would not have been difficult to keep my mouth closed—up there, at any rate. The organ through which oxygen does not pass must be shut; if not, the other one will not draw the oxygen quite so well. I started using the gas at an altitude of two miles up with but a small flow, and kept increasing it until I had the regulating valve wide open when I was six miles high. Even at that point, I felt the necessity for more oxygen; I became slightly dizzy and tired. I opened the emergency occasionally, to try it out and to get the benefit of the high pressure it afforded. Certainly it came into my mouth with force, so strong that the plugs were nearly blown from my nose.

I was feeling drowsy and tired from the lack of oxygen even though I had the pure gas flowing into the mouthpiece and into my mouth, for it was not getting down into my lungs. I expanded my chest as far as I could, but the oxygen would not go on down. It came into my mouth, as I said before, but most of it went out through the exhaust tube.

You see, a man's lungs are pumps—nothing more. Down on the ground when he expands his chest, a partial vacuum is produced in the chambers of the lungs and air rushes in to fill that space. But the air exists at a pressure of fifteen pounds to the square inch; at seven and one-half miles altitude, the pressure is less than three pounds to the square inch, and begins to get less than the water vapor pressure in the lungs. That is to say, when the air pressure becomes low, the water in the lungs starts to form a vapor, or steam, and comes up through one's windpipe. Consequently the oxygen cannot get down; in fact the normal quantity of oxygen in the blood passes into the lungs and is exhaled. Our flight surgeons estimate that at some altitude between eight and eight and one-half miles the air pressure is so low that no oxygen can possibly enter the lungs, and that a man will faint if he remains in this zone for any length of time. You may recall that the late Captain Gray of the Army Air Corps, who is believed to have lost his oxygen supply when he took his balloon to about eight miles, really perished as a result of oxygen starvation. An airplane would have fallen rapidly just as it has done with an unconscious pilot; but the inert balloon gave Captain Gray no chance to get back down to denser atmosphere.

## A Helmet for the High Regions?

WE have been studying this situation with a view to developing some device such as a deep-sea diver's helmet to allow the head of the pilot to remain in atmosphere similar to that at sea level. Thus far nothing satisfactory has been worked out; the difficulty lies in the fact that exhaust valves must be attached to such a helmet, and will freeze either open or shut under the low temperatures, thus placing the pilot in a most awkward and dangerous position.

As far as breathing equipment is concerned, then, it is probable that man can go no higher than eight and one-half miles. Of course, I am speaking of the equipment we have at the present time.

The clothing that altitude seekers wear is much better suited for the purpose than the breathing devices; I believe that a man can go to unlimited altitudes without freezing any part of his body, or even suffering much discomfort. All of the apparel I wore in my flights did not weigh more than ten pounds, but I didn't feel the necessity for more even in the coldest zone reached, which was 76 degrees below zero. It does not become colder than that at any height. Lieutenant-Commander Miles of the Bureau of Aeronautics advised me to wear the fewest garments possible; I learned from experience that his advice was good. I wore a pair of fur-lined boots, a fur-lined suit, combined helmet and face mask which were fur lined, heavy fur mittens, and ordinary goggles. I removed shoes and underwear; the Nutria fur suit was thin, but was of fine enough texture to keep out the wind and retain the warmth generated by the body. I confess that I had my doubts about this clothing before I went up, but am convinced now that it could not be improved. I am of the opinion that electrically-heated clothing is unnecessary.

Electrically-heated goggles, though, are absolutely essential. I tried using various devices such as perforated lenses, screens, and gelatins, but nothing prevented the formation of frost except the hot electric element.

When man cannot see, he is helpless, especially if he happens to be in an airplane. When I attempted the airplane record, I did not have the heated goggles and had many difficulties when the frost formed. I removed the goggles so I could see, but couldn't keep them off for long as the skin around my eyes, exposed by the eight holes in the face mask, began to give me considerable pain. The plane was wobbling around like a kite on a windy day, yet I could keep it level only as long as I could see. When I tried to hold the goggles just clear of my eyes and handle the control stick with my knees, neither action giving me good vision or proper manipulation, I fell off in a spin. Perhaps I could have gone somewhat higher had I been able to hold the plane steady at the higher levels.

For the seaplane flight, my brother, Lieutenant Zeus Soucek, made me a pair of electrically-heated goggles, and I had no such difficulty as I encountered previously. In fact, I could see perfectly, and must have gained 500 or 1,000 feet after the wobbling began. The controls were stiff from the cold, but I could handle them well, since it was not necessary to remove my hand. I should explain that my left hand could not be used for any purpose other than keeping the engine throttle and supercharger valves open; we put them under spring tension so that they would shut automatically and stop the engine in case I fell unconscious, thus preventing the engine from speeding itself to pieces in the dive.

Since these goggles are satisfactory at seven and one-half miles, it is very likely that they would give good results at higher altitudes. Therefore, I believe I am safe in saying that frost formation on goggles is highly improbable, and restricted vision need not be feared as an obstacle in higher climbs.

Goggles, clothing, and breathing equipment are perfected to such a state that they will enable a man to go to any height. Yet those are but accessories; they merely assist in maintaining natural or sea-level conditions for the pilot.

There is no doubt but that the future plane for high altitudes must overcome the disadvantages already mentioned by the equipment of fully enclosed, electrically-heated cabins. In

(*Continued on page* 948)

# The Heat Ray

(*Continued from page 897*)

parts of these he could not understand, but the whole plainly showed the agony, the tireless labor and the unutterable longing of the man to complete his invention. Failure after failure—the man had fought his way through, and in the end he had won—what? Fear and Death! And how little, thought Anton, could his father have known, how little foreseen, what misery and destruction his invention would bring upon his country! Anton began to see, as he sat silent there in the glow of the afternoon sun, that it was no fault of his father's that the evil had come. It was not even the fault of the lifeless thing that had been John Merton Graves, charred and burned now in the ashes of his airplane. It was the genius of misguided and thoughtless invention that had created the evil; the thirst for power, that had been willing to kill in order to get possession of it; the selfish desire common to all men, that had made the ray a source of misery. But like a boomerang the heat ray had brought disaster to the individual men who had owned it.

It was the heat ray itself that was guilty—not these men who had built it and used it! Anton seemed to see the black shadow of the ray, like a gigantic monster, looming over the heads of men and women, darkening the lives of innocent people, striking them down, and laughing as it struck. As he thought of these things his anger grew, and he looked around him to find a way to destroy it. He saw the spring bubbling and gurgling; he rose and walked up to the little knoll. He could not see to the bottom of the pool, so deep was the water; and his heart told him that here was a way. He lifted the portfolio.

"There shall be no more heat rays. . . ." He dropped the portfolio into the spring. Down it sank, a vague bulk in the sparkling water, and the light, catching its polished fastenings, sent long reflected beams back to the surface until it had disappeared.

## Epilogue

WITHOUT its leader, the bandit organization disintegrated. Like a house of cards crumpled the elaborate system that Graves had built up with so much care and effort. A rejuvenated police force captured one after another of the ray-equipped planes. And Anton (for it was under his leadership that law and order won slowly back what had been lost), true to his vow, destroyed each ray-projector as it fell into his hands. Six months after John Merton Graves met death in the wreck of his plane, the last of his men was sentenced to prison; and the last heat ray, a most innocent-appearing black box-like contrivance, was placed behind plate glass windows in the Washington Museum, there to rest, the recipient of thousands of awed glances, until it should rot away into the dust from which it had come.

THE END.


# One Hundred Dollars in GOLD

## for a SLOGAN for

AIR WONDER • STORIES

**A few moments of your spare time NOW may bring you $100.00 in GOLD!**

WE want a catchy slogan for this magazine. Slogans are used universally in many different lines of business, and we believe that this magazine should be known by its own slogan.

Such slogans as "NOT A COUGH IN A CARLOAD"; "GOOD TO THE LAST DROP"; "SAY IT WITH FLOWERS," etc., are well known. A number of magazines have already adopted slogans; such, for instance, as "Popular Mechanics," with "WRITTEN SO YOU CAN UNDERSTAND IT."

We are offering $100.00 for a novel, as well as descriptive, catchy phrase; which we shall use after the end of the contest as a permanent slogan of this magazine.

REMEMBER, THERE IS NOTHING TO BUY OR TO SELL!

You have an equal chance to win this prize, regardless of whether or not you are a subscriber. The contest is open to all. Get your friends in on this and, if they give you suggestions, you may split the prize with them, if you so desire.

To win the $100.00 prize, you must submit only a single slogan, ONE ONLY. It must be an original idea. It makes no difference who you are or where you live, whether in this country or not; anyone may compete in this contest and you may be the winner.

Look this magazine over carefully and try to find out what it stands for, what its ideals are, and what it tries to accomplish. Then try to put all of your findings into a slogan which must not, under any circumstances, have more than seven words.

After you have the idea, try to improve upon it by shortening the slogan and making it sound more euphonious, but always remember that it is the idea which counts. The cleverer the slogan, and the better it expresses the ideas for which this magazine stands, the more likely are you to win the prize.

No great amount of time need be spent in the preparation of slogans. Start thinking right now and jot down your thoughts. Also, tell your friends about it, and get them to submit slogans of their own, or compose one in partnership with them.

Here are a couple of sample slogans; which are given as mere suggestions, AND NOT TO BE USED AS ENTRIES:

"THE MAGAZINE FOR AIR-SCIENCE FANS"
"SCIENCE AVIATION OF THE FUTURE"

## RULES FOR THE CONTEST

(1) The slogan contest is open to everyone except members of the organization of AIR WONDER STORIES and their families.

(2) Each contestant may send in only one slogan; no more.

(3) Slogans must be written legibly or typed on the special coupon published on page 951 of this magazine. (If you do not wish to cut the magazine, copy the coupon on a sheet of paper exactly the same size as the coupon.) Use only ink or typewriter; pencilled matter will not be considered.

(4) Each slogan must be accompanied by a letter stating in 200 words, or less, your reasons for selecting this slogan.

(5) In case of duplication of a slogan, the judges will award the prize to the writer of the best letter; the one which, in their opinion, gives the most logical reasons for the slogan.

This contest closes on May 1, 1930, at which time all entries must be in this office; and the name of the winner will be announced in the July, 1930, issue of AIR WONDER STORIES, on publication of which the prize will be paid.

Because of the large number of entries which may be expected, the publishers cannot enter into correspondence regarding this contest.

Address all communications to:

*Editor, Slogan Contest*
Care of AIR WONDER STORIES
96-98 Park Place New York, N. Y.

(*Continued from page 907*)

enough gas-bombs to paralyze your whole crew. They're all down there now unconscious—I used a mask for myself, of course—but they're not hurt and will be coming to in an hour.

"But I'm afraid that will be a little late. For I waited to make this coup, to gas the crew and stun you, until we were just at this particular position in space. It is the prearranged position, and less than five thousand miles off this space-lane my own rocket and crew are waiting for me. We're heading toward them now, and before your crew wakes, Evans, we'll be with them and this rocket will be in their hands. You and your crew won't be harmed, of course—we can set you loose in a life ship near the moon—but this Earth-Guard craft we'll keep and it should prove highly useful. An ingenious plan, everything considered, don't you think? Nothing overlooked."

Evans' brain was spinning as the Hawk's amusement-filled voice ceased. The great rocket was out of the space-lane by now, he knew—was heading under the Hawk's guiding hands to the prearranged position in space where the black rocket of the corsair waited with its crew to take complete possession of the prize. And the Hawk had captured it, had captured an Earth-Guard rocket, alone!

Evans raged at his bonds in senseless fury. His hands, tied before him, were cut deeply by the cords holding them as he strained to break these. The Hawk looked up from the bank of firing-levers with which he was busy to shake his head in mocking reproof.

"Now, now, Captain Evans," he soothed, "don't take it so hard. Lots of captains have found themselves in your position before this, remember. Though I'll admit this is the first Earth-Guard rocket I've taken."

"No Earth-Guard rocket has ever been taken by an enemy," said Evans thickly.

"Not until now," the Hawk conceded, depressing two more firing-levers. "But there has to be a first time for everything—and from what I heard on earth I don't think the capture of an Earth-Guard rocket will excite any anger."

It would not, Evans reflected dully, sinking for the moment into an apathy of despair. It would be merely with scornful laughter, that the Earth-Guard would be met when this latest and greatest exploit of the Hawk became known. What derision would meet the news of this single-handed capture of a great rocket and all its crew, by the man they were hunting! Evans could picture at the moment as clearly as though a face were before his eyes, the shame and rage of fierce old Commander Cain when the news reached him, and the shame of all his companions in the Earth-Guard.

HE could hear the thin, derisive laughter of the crowds; the new and side-splitting witticisms in the teletheaters, the laughter of all on earth and moon alike became audible to him. A fierce resolve, a last expedient of his despair, rose in Evans' brain. He rose to his feet, tied as they were, and swaying, leaned forward to catch at the control-board's corner with his bound hands supporting himself. The Hawk watched him curiously, with nothing to fear from this one man, who, bound hand and foot, alone remained conscious of the rocket's crew. Evans leaned across the control-board and its banked levers toward the Hawk, and as he did so his two bound hands were moving, slowly, unobtrusively, toward the control-board.

"No Earth-Guard rocket has ever yet been captured," he said slowly and hoarsely, his hands very near the black plug at the control-board's corner, "and none is ever going to be."

The Hawk's dark eyes, contemplating him, held something that seemed to be almost sympathy. "Sorry, Captain Evans," he said lightly. "I know how you must feel about it—but we're almost there now. My rocket will be showing up in a few minutes—we've almost reached it."

Evans laughed grimly. "Your rocket will never see us again nor will anyone else. You said you'd overlooked nothing, Hawk, but you did overlook one thing!"

"And that?" The Hawk's figure was suddenly tense.

"That is something that you didn't know—that is the fact that in every Earth-Guard rocket is placed a device for destroying the rocket in case it has to be abandoned in space. That device is a plug which when pulled out ignites the rocket's fuel tanks in six minutes. And that plug—"

The Hawk's hands flashed toward Evans but before they could reach his bound hands, Evans had seized with them the black plug at the control-board's corner and with a crazy laugh had jerked it out!

For an instant there was a supreme silence in the pilot-house of the hurtling rocket, the Hawk and Evans facing each other like two statues. Then with a single motion the Hawk had whirled, was out of the pilot-house. There came the clang of contact-doors above being opened and shut with lightning rapidity, and then a blast of firing-tubes as, in his own little rocket, the Hawk drove clear from the great Earth-Guard craft. Evans stood still for a moment, then dragged himself to the control-board's other side.

His bound hands pressed the firing-levers in quick succession and as the great rocket lurched beneath their impetus it was turning in space, turning back toward the space-lane from which the Hawk had taken it! Evans grasped the black plug on the board and thrust it back into its socket. A small ventilating fan at the other side of the pilot-house that had ceased running when he had withdrawn the plug began spinning again. Evans laughed weakly.

He straightened. There was a flash of fire above and he saw that it was the tiny rocket of the Hawk, driving back over the great Earth-Guard craft. Evans knew that the Hawk, from afar, had seen that the ship had not exploded, and he was coming back. Evans realized that although the Hawk could not make contact with the great Earth-Guard rocket thundering at full speed through the void, with rocket-gun available, he could still blast the Earth-Guard ship to pieces. Evans saw the little rocket swooping down until it was just before and above him, and braced himself with tight-set teeth for the blast from its electric gun.

It did not come. Instead, as the Hawk's little rocket dipped low, there flashed from it the vari-colored lights of a signal. Red—yellow—red—purple—Evans read the signal automatically, uncomprehendingly for the moment. It was "Salute!" And then he understood. The Hawk, knowing himself tricked, had come back not to take revenge but to give that sportsmanlike hail to the man who had tricked him. Evans' bound hands touched the signal-studs, and from the great Earth-Guard rocket's nose in its turn flashed the same signal "Salute!" Salute of the Earth-Guard's captain to the Hawk, as they roared past each other in space! And then the Hawk was gone, his little ship hurtling away into the chartless void outside the space-lanes where his great black rocket waited. Evans slumped weakly against the control-board.

They found him there when they burst up into the pilot-house a half-hour later, Calden and Hartley and the others, babbling excitedly and uncomprehendingly. They had just returned to consciousness. They found Evans against the control-board with hands and feet still bound, keeping the great rocket steady on the space-lane to which he had brought it. When he turned toward them they saw with amazement that he was laughing.

"I was just thinking," he said, "of what old Cain will say when he finds out that he shook hands with the Hawk!"

THE END.

# AVIATION NEWS OF THE MONTH

## CONSTRUCTION

### Lindbergh's New Plane a "Flying Laboratory"

J. L. MADDUX, head of an aviation organization with which Colonel Lindbergh is connected, has declared that Colonel Lindbergh's new low wing monoplane, which was described in the February issue of this magazine as a "flying laboratory" designed to test high-altitude flying in anticipation of the future development of aerial transportation. The colonel is planning to carry out a number of flights in cooperation with Naval meteorological experts and with the United States Weather Bureau, and he will test the use of various atmospheric conditions found at high levels. The famous flyer has been interested for a long time in the possibility of transporting passengers and mail at times above storm cloud layers. He is especially interested in securing increased speed in the rarefied upper atmosphere by making use of the high-speed wind currents believed to prevail there at all times.

### Airplane Carrying Bus Planned

A GIANT motor bus has been visioned by an inventor who prefers to keep his identity a secret, according to the *New York American*. This bus, to be built for transcontinental service, is to be nearly as large as an ocean liner, and it will be equipped with a landing deck for airplanes. The bus would ride on six unbelievably huge pneumatic tires and a series of rollers. An elevator would take passengers to the various decks, these decks to be arranged as they are on liners. At the stern of the bus will be a swimming pool. On the rear deck will be the airplane landing field, equipped with all apparatus for allowing the machines to take off for flights during the course of the trip. Of course, the question of a road for this monster has not yet been settled, but the important part of the program lies in the fact that airplanes will be a very important part of the equipment carried.

### New Autogiro an "Old Man's Ideal"

A NEW development of the Cierva Autogiro has been hailed as the ideal airplane for elderly men. It is capable of taking off within a ring of thirty yards and of landing within its own length. There are horizontal rotors above the fuselage which lift the plane. These are used instead of the conventional fixed wings of ordinary machines. Since the horizontal rotor was first demonstrated in 1926, great strides have been made in its development. Tests have shown that it is impossible to stall the machine in the air, and the extraordinary slow landing speed gives the pilot ample time to select a good landing place, even in a congested district. The autogiro is considered a valuable link in the transportation systems of the future, since it will probably be the most convenient method of getting from an office to airdromes whence air liners are operated.

### French Build Unique Transport Plane

A NEW French [illegible] monoplane embodies several new [illegible] of [illegible] which [illegible] The [illegible] motors, [illegible] reduction gears. The *DB 70* is one of the largest planes of its kind yet constructed. It accomodates 28 passengers for day operation and 24 for night flying. The unusual feature of the plane lies in the fact that there are two fuselages, each completely equipped. The major part of the passenger accommodations are in the large central section between the wings, which are of the thick type. These accommodations consist of two cabins, connected by a large central salon, having together a volume of 2,050 cubic feet with a floor space of 315 square feet and a height of 6 feet 2 inches. Each cabin occupies a section of the center, and extends into its corresponding fuselage.

The three motors are installed in front of the center section and are easily accessible in flight. The plane, with a cruising speed of 112 miles per hour, and having a wing spread of 120 feet, lifted a load of 5 tons after a run of only 400 feet.

### New German Invention Lands Planes on Liner

A NEW German invention, making it possible to bring a seaplane from the ocean surface to the deck of an ordinary passenger liner with a minimum of danger and inconvenience is described by Martin Grell in a report to *Das Umschau*. It consists of a runway of sailcloth which can be unrolled from the stern of the ship and trailed in the water, allowing the plane to climb upon its lower end, whence it is pulled to the deck by a winch. The canvas is kept taut and its lower edge held beneath the water by a suitable drag. With the ship steaming at a reduced speed of from five to seven knots, the runway is said enough to support an ordinary plane and five men. The device was constructed because of the recognized need for a safer and more convenient means of contact between plane and ship than the method hitherto in use, of hoisting the floating seaplane aboard by means of a crane. In anything but a dead calm, there has always been the danger of bumping the aircraft against the ship and thereby damaging the one or the other.

### New Foreign Planes Have Speedy Lines

LAUREN D. LYMAN, writing in *The New York Times*, mentions some of the news items from *All the World's Aircraft*, a British annual publication which has no counterpart in this country. This publication deals comprehensively with the new aircraft developed in Europe, and all indications point to the fact that the new foreign planes have followed the racing machines used in the Schneider Cup competition, with the result that most of them have lines characteristic of high-speed racing planes. This tendency is particularly pronounced in England and in France. The sport type of plane has been developed to keep pace with the military machine, which in England and France always receives prime consideration. The latest products of the foremost builders of aircraft usually go to the governments, which are always anxious to add to their fighting air fleets the fastest pursuit planes and the most efficient observation machines.

### Bellanca Building New Air Transport

G. M. BELLANCA, who built the plane in which Chamberlin and Levine flew across the Atlantic, is building a new single-motored air transport, which will carry twelve people. The builder has always been an advocate of single-motored transport planes, which are much cheaper than the tri-motor types. The projected plane will sell for about $30,000, which is less than half the price of the tri-motored planes. It will have a top speed of 15 [illegible] an hour, which is the minimum the designer believes is necessary for economical transportation. [illegible] plane must be operated at a cost of from 50 to 75 cents a mile. The new plane has a wing spread of 65 feet. It is of the sesquiplane type, with lift struts connected to a lower stub wing with a span of 14 feet. The machine will have an over-all length of 41¼ feet, a height of a little more than twelve feet, and will be powered with a 525 H.P. *Hornet* engine. Another plane of the same model will be driven by a 625 H.P. Curtiss water-cooled *Conqueror*.

### $75,000,000 in Airports Planned For 1930

ACCORDING to specifications filed with the Bureau of Aeronautics of the Department of Commerce, 1,361 airports are to be constructed this year throughout the United States. The total sums invested will amount to $75,000,000.

During 1929, 899 airports were built. The new production schedules call for the expenditure by municipalities of $2.50 per capita. The individual outlay will range from $1 to $14 per capita. The construction of the new ports will assist greatly in the solution of the unemployment problem, by providing work for thousands of people in various branches of industry.

### German Plane Has Been in Use 10 Years

SEVERAL veteran planes are being used in Germany with remarkable results for craft of that age. A Junkers "F-13," which carries the first German identification mark, has completed ten years of flying service, during which time it has outlived six motors. It has made 2,543 flights, has been in the air for 2,403 hours and has covered approximately 350,000 kilometers—all over Europe. Another German plane has more than 3,140 hours to its credit, and there are nine other planes which have more than 2,600 hours in the air.

### 6,000 Aircraft Produced Here in 1929

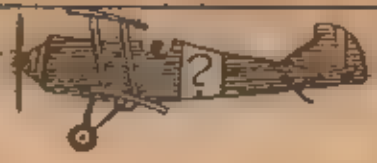
AMERICAN aircraft builders built more than 6,000 airplanes during 1929, an increase of about 27% over 1928. This is the greatest number of planes produced in any one year in the entire history of aviation, according to the annual production report of the Aeronautical Chamber of Commerce. Engine production also showed a marked increase, and the total retail valuation of planes, parts, and engines produced was $98,000,000. Open cockpit planes led all others in the numbers produced, with closed cockpit monoplanes second. However, of all types produced during 1929, amphibians showed the greatest increase over 1928.

### Plan "Flying Hotels"

JOHN E. LODGE, writing in *Popular Science Monthly*, describes the latest [illegible] in aviation development—gigantic eight-motored [illegible] to carry 160 passengers and crew in their [illegible] low wings. The planes are to be built by a [illegible] ticut firm, and are to be used for transcontinental flights. The [illegible] with wing spreads of 262 feet would be twice the size of any ever built.

The hollow wings, measuring nine feet from top to bottom at the thickest part, will contain the passenger cabins and the dining salon. Two [illegible] each [illegible] seventeen, with room to spare for two passenger salons. Each salon will seat 42 persons, and the remainder of the passengers will be in cabins along the leading edge of the hollow wing. Cabin seats will be convertible into cabin berths. The [illegible] driven by [illegible] power. These [illegible] four engines each [illegible] A [illegible] ments, and these will be connected.

(*Continued on page 950*)



# AVIATION FORUM

THIS department is open to readers who wish to have answered questions on Aviation. As far as space will permit, all questions deemed of general interest to our readers will be answered here. And where possible illustrations will be used to answer the questions. Queries should be brief and not more than three should be put in any letter. Address all communications to the Editor.

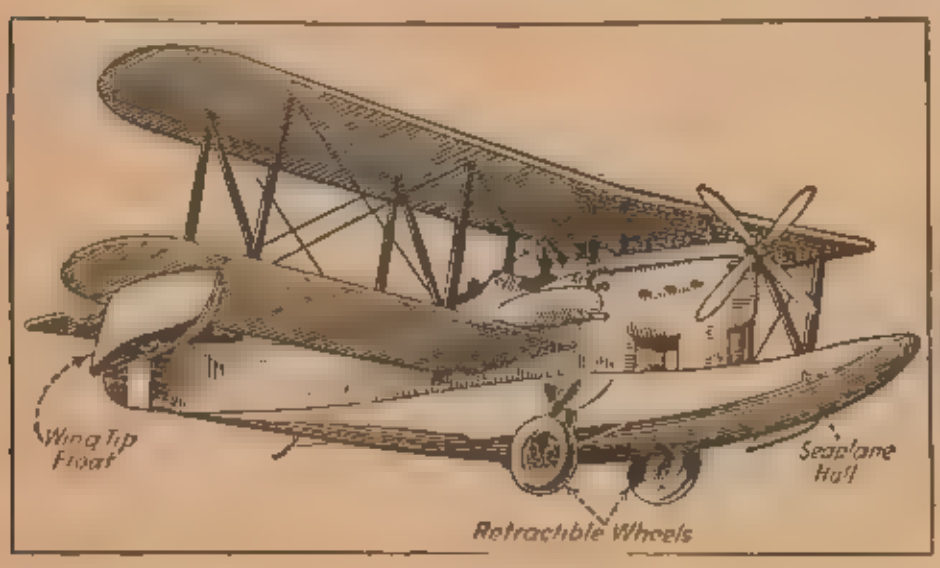
## The Amphibian Plane

*Editor, Aviation Forum:*

I have heard a great deal about the "amphibian" plane and its usefulness. What is the meaning of the term "amphibian," and how does this plane operate, as distinguished from other planes?

S. B. STOLZ,
500 Park Avenue,
New York City.

(The term "amphibian" is used to designate a plane which can alight on water and on land. The amphibian machine has an advantage over the hydroplane or seaplane, which can alight only on water, and the ordinary land plane, which can come to rest only on land, or on some surface built to receive it, like a landing platform. The term "amphibian" refers originally to creatures which can live in two elements—like crocodiles, for example—which are at home under water and on land. It comes from two Greek words "amphi" and "bios" meaning "double" and "life."




Showing one type of the amphibian plane ready for landing on the ground. The retractible wheels are drawn into the hull before the plane alights on water. (From *Everybody's Aviation Guide* by Victor W. Page. (Henley).

The amphibian is different from other machines in the construction of its landing gear. It is equipped with both a buoyant hull, like a seaplane, and with landing wheels, like an airplane. When the plane is about to descend on the water a control device lifts the wheels out of the way. When the plane is to alight on land the same device sets the wheels back into place. (Illegible) In the drawing which illustrates the Loening Amphibian one of the most effective types of the wheels are shown extended for a landing on land.

Although the first amphibian planes were of clumsy design, with (illegible) to make them navigable on land as well as on water, and to make the landing gear easily recognized. It is unnecessary to expand upon the advantages of a plane which can alight on land or on water.—*Editor.*)

## Space Ships and Gravity

*Editor, Aviation Forum:*

Why do authors use various ways of giving their space ships high velocity before leaving the earth? It seems that if a ship had the power to overcome gravity at all, it could rise as slowly as desired. If not, how would they prevent a crash on returning? Gravity would have the greater power, causing the ship to fall to earth at tremendous speed, and even with some sort of wings the air would be so thin that it would not check a space ship going at great speed.

What is the greatest acceleration in miles per second that the body in a space ship can stand without serious injury? Without serious discomfort?

ORAL ARNEL,
Cedarville, California.

(Authors who write of space ships must take into consideration the fact that the vessels operated by power which is the result of the consumption of fuel, and a speed must be used which consumes the least fuel. If an air economizer could be used and the journey were made slowly, the crew would be required for the longest part of the flight. The idea in the space flying ships is to get out of the gravity of the earth as quickly as possible. It has been calculated that once a speed of 5 miles per second is attained, a body can escape from the gravitational pull of the earth. So the aim is to reach that speed as quickly as the people in the ship can be accelerated.

For a fuller discussion of this question see SCIENCE WONDER STORIES for January, 1930. On page 751, in answer to a question by Felix Wadel, there is a complete discussion. Mr. Wadel suggested a force or energy of 6 pounds and 14 ounces to lift a man away from the earth. Now since the man weighed 141 pounds the total force applied to him was 156 pounds 14 ounces. This gave an acceleration upward of 1.46 feet per second each second. It was shown how, by not quite doubling the upward force, that is by applying a force of 300 pounds on him, the acceleration was 32.16 feet per second each second, an acceleration more than twenty times as great as in the first case.

It is obvious that energy is used more economically by accelerating the space ship swiftly and getting a much greater initial speed.

A crash on returning may be prevented in a number of ways. By firing rockets toward the earth, the space ship's speed would be checked and it could let itself into the atmosphere a good deal more slowly than it would if it were falling freely. Professor Goddard sent a rocket equipped with delicate instruments to a great height and the instruments were returned to earth intact. After the space ship is within the atmosphere of the earth, it can resort to the principles used by airplanes, and by wings maintain itself in the air without being drawn too quickly.

The greatest acceleration [in an upward direction] which (illegible) to great extent (illegible) of the (illegible) upon an accelerated body (illegible) is (illegible) the speed (illegible) second. It is a law of (illegible) that the force (illegible) upon an accelerated body (illegible) is (illegible) and (illegible) at a rate (illegible) equal to that of gravity (illegible) which would be (illegible) 15 pounds. This weight (illegible) now (illegible) as though he weighed 300 pounds. A greater acceleration brings a proportionately greater strain. But as soon as the speed becomes constant, no matter what it is, the person feels normal again. In other words, the problem of space flying must take into consideration what the body can stand in acceleration, not in a constant speed.

An everyday occurrence may explain this. A person is in a high speed elevator which starts from rest and at the end of the first second it speeds 32 feet per second. The acceleration will have been therefore 32 feet per second *per second* and the man will be pressed against the floor with a force of 300 pounds. Then, when the elevator slows down, his weight is accordingly diminished; he experiences a curious sensation again. The illustration explains this phenomenon that we have all experienced.—*Editor.*)

## The Revolution of the Atmosphere

*Editor, Aviation Forum:*

(Illegible) a question that has doubtless been propounded thousands of times, and is probably explained in any elementary book of physics, yet I often find myself wondering at it. Does the atmosphere of the earth revolve at the same speed with the earth? If not, why, when a person gets up in an airplane does not the earth's surface swish away from him and reappear in the east at the speed at which the earth rotates?

E. W. SHEPHERD,
4 (illegible) Avenue,
Huntington, West Virginia.

(The atmosphere of the earth revolves with the earth, just as the white cover on a baseball moves whenever and however the entire ball moves. For this reason the ground does not swish away beneath an aviator, for he is controlled by the same natural forces that control him on the ground. As a matter of fact, however, if it were possible for an aviator to get outside of the atmosphere of the earth—which has a definite limit—the earth would swish away from the aviator as the question states. Then, if he tried to re-enter the atmosphere of the earth, he would be met by a wall of air revolving at more than 1,000 miles an hour, and this air would be as hard as a solid wall of steel. This question was discussed more fully in the editorial in the January issue.—*Editor.*)

## Power for Rocket Flights

*Editor, Aviation Forum:*

If the fuel used in a rocket or space car needs air to form an explosive mixture, how is enough air supplied in the near vacuum of space? If compressed air is carried along, how much space would it require on a trip, say, to the moon?

CLARENCE R. LEITZ,
1333 Seventh Ave., North,
Fargo, North Dakota.

(We assume that Mr. Leitz means "oxygen" and not "air" when he speak of an explosive mixture. A rocket ship would be (illegible) to carry compressed air or some other explosive substance (illegible) for a journey to the moon (illegible) or get out (illegible). One would have to know the weight of the ship, the speed it could attain and the power of the fuel. However, there is (illegible) to "The Space Ship Society" (illegible) to Fal, Inc., (illegible) of SCIENCE WONDER STORIES, one of the greatest of all space flying (illegible). Dr. Willy Ley makes some statements concerning the weight of the equipment. He says: "The motor which is to carry persons [or for that matter, itself only] into space must actually develop more than 100 horsepower for each kilogram of its own weight, in order to be able to combat successfully the powerful attraction of the earth."

At the present time Professor Goddard is preparing to release a rocket into space; and if this rocket reaches the moon [as it may] we will then have authentic figures as to the amount of oxygen and fuel needed for such flights.—*Editor.*)

# THE READER AIRS HIS VIEWS

IN this department we shall publish every month your opinions. After all this is your magazine and it is to be for you. If you fall down on the choice of our stories, or if the editorial board slips up occasionally it is up to you to voice your opinion. It makes no difference whether your letter is complimentary, critical, or whether it contains a good old fashioned brick-bat.

All of your letters, as much as space will allow, will be published here for the benefit of all. Due to the large influx of mail, no communications to this department are answered individually unless 25c in stamps to cover time and postage is remitted.

## A Tribute to E. G. Key

*Editor, AIR WONDER STORIES:*

May I express my appreciation of the splendid story "The Red Ace" by Eugene George Key, in your February issue?

It had a magnetic grip on my interest, riveting it from the first words to the Last. Never before have I read anything that made me realize so vitally what a wonderful part science plays in this life.

This story displays an unusual amount of talent—one might even say genius. The idea is so cleverly and splendidly presented before the reader! Mr. Key should be congratulated on his ability to conceive such a worth-while story.

May we have more stories by this young author? They are, in my estimation, the best you have ever had.

May AIR WONDER STORIES continue to give the reading public, stories that are really entertaining as well as educational!

MARION JACKSON,
Hobart, Indiana.

(This letter is the most outspoken in the crescendo of praise for Eugene George Key. This young author has made a remarkable "hit" at the very beginning of his career and we prophesy one huge future for him. If our readers want more stories by him they shall have them. It is our policy to give them what they want—whenever we can do so. *Editor.*)

## He Can Manipulate Them

*Editor, AIR WONDER STORIES:*

We bought our first copy of your interesting magazine and have read the three short stories, "Lizers of Space," "The Vanishing Fleet," and "The Red Ace" were all enjoyable. It seems to us here in the far south who dabble in the study of science that "The Red Ace" is the most plausible and credible of the three. It might be that Mr. Key is a more seasoned writer than the others, for he seems to attack his subject as though he knows his business and at no time does we see [illegible] to conceal a lack of scientific knowledge. At any rate, he can manipulate a plane, an electric current, and a pen. We shall continue to buy your publication.

MRS. S. P. MILLER
Harrisville, Mississippi.

(We have received letters which states that Mr. Key possessed talent of a very high order. "The Red Ace" is a very well written story which fulfills the highest traditions of science fiction. Mr. Key is a rising young author, the type of writer we select for our magazines. We predict that the reading public will hear a great deal more of him. *Editor.*)

## Does the Sun Repulse Planets?

*Editor, AIR WONDER STORIES*

Referring to page 653 of your January, 1930 issue, in your answer to Roy Braund's question, you say that the sun does not repulse the planets. Certainly it does! When a planet is cold it grows whiskers [vegetation and bacteria] how about the thousands of light particles or ions, star dust or starch which impinge on the earth's surface every day? One of the causes of the layers of mud and dirt which are quite perceptible over a course of a few million years. They must surely exert a pressure opposite to the pull of gravity, more so in the centrifugal force created by the rotation around the sun, which is a balancing force.

R. L. GREENIG,
3125 N. 30th Street,
Philadelphia, Pa.

(We are glad Mr. Greenig disagrees with us, as it gives us an opportunity to explain some of the points he mentions. As far as the greatest astronomers have been able to discover, the only force which keeps the planets from falling into the sun is centrifugal force. A homely illustration may be given by means of the open milk pail full of milk which can be swung around in a circle without any of the milk spilling out. As long as the speed of the swing is maintained, nothing will happen. The pail will always be pulling away from the handle. But if the speed is diminished, or stopped, the pail will immediately fall upon the handle, and the milk will run out (if the pail is in the air). The same principle applies to the earth. As long as it maintains its centrifugal speed, nothing will happen to it.

As to the star dust and ions and mud exerting an anti-gravitational force: We know that "star dust" filters down through the atmosphere from disintegrated comets, from meteors, and from other celestial bodies. But this infiltration is so insignificant, compared to the mass of the earth, that it cannot possibly exert any influence against the tremendous pull of the sun. "Ions" are supposed to be electrical particles. Some of these cause the "Kennelly-Heaviside" layer which distorts radio reception. They are the result of sun spots which cause "ionization" of the atmosphere—a condition which forms an ionized "roof" which reflects back radio waves.

The mud which has formed layers during the millions of years of the earth's geological periods is not the result of star dust, but the deposits of material washed down from ancient mountains which have now become level. As the mountains diminish, the earth beneath, built up through the action of millions of years, rises up, with the result that many of the flat table-lands of to-day were high elevations in prehistoric times. The building up of the layers of mud does not add to the "repulsion" of the earth to the sun. It may be true that something is added to the mass of the earth by the infiltration of dust through the atmosphere; but these particles do not interfere with the attraction of the sun. The question has, for all practical purposes, been scientifically explained by our astronomers, but if Mr. Greenig still believes that dust exercises an anti-gravitational force, he should consult such books as "The Universe Around Us" by Sir James Jeans, and other works, like "The Heavens" by Henri Fabre. These volumes, and others like them, will give anyone a clear idea of the accepted theories concerning the solar system. *Editor.*)

(*Continued on page 953*)

## ANNOUNCEMENT

# SCIENCE FICTION WEEK

OWING to a great number of requests from our readers, the week between March 31 and April 7 has been designated as SCIENCE FICTION WEEK. This period will be for our readers an opportunity to spread the gospel of science fiction throughout their city. We are certain that all followers of our magazines will wish to help in making known to everyone the existence and the power of this great educational force.

Our readers may do this in several interesting ways which will bring them into the public eye and mark them as the pioneers in science fiction. Boys and girls may give speeches to their school mates in their classrooms, telling of the pleasurable hours, the stimulation and knowledge that come with reading science fiction; men and women may speak to their fellow-workers and friends; others may write letters to their local newspapers for an editorial on the subject, and so forth. This is going to be a big week for science fiction enthusiasts, and those who assist in spreading the news will be conferring an immense benefit on all who have not yet had the pleasure and profit that comes from close acquaintance with science fiction.

## — FREE —

In order to further this movement, the publishers of AIR WONDER STORIES have printed some attractive poster-stickers in several sizes which will be furnished free, postpaid to all readers. These little posters are available in the following sizes: 6 inches, 4 inches, and 2 inches. Our readers can obtain these by writing to the Editor, AIR WONDER STORIES, 98 Park Place, New York, stating how many they can use.

The purpose of the posters is to paste them in all available spots where they will attract passersby. Locations such as show windows, newsstands, telegraph poles, blank walls, etc., can be used readily.

This is a big movement, and we hope that our readers will be sufficiently interested to get behind "Science Fiction Week" in a big way and do their bit in spreading the gospel of science fiction.

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YOU, too, can be trained for a big-time radio job . . . Clip this coupon now and send for this FREE BOOK . . . Read it page by page . . . see for yourself why thousands of fellows just like you are now making from $50 to $100 a week . . . why many others earn as high as $10,000 to $15,000 a year and even more. This free book gives you 40 fascinating pages of pictures and text, all about RCA Institutes, the only school that is endorsed by the Radio Corporation of America . . . The school that actually sends you radio instruction direct from RCA . . . the very source of radio achievement!

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SFG 4


## How High Can Man Fly?

(*Continued from page* 941)

this way not only will the pilot be warm at all times but it will be fairly simple to have sea-level conditions of pressure and oxygen content maintained constantly in the cabin. But even if that problem is settled, the most important difficulty has not been mentioned. I refer to the airplane structure and its power plant.

### Forcing a Ton Up for Eight Miles

IT is a tremendous task that we are imposing on an airplane and an airplane engine when we demand that they go higher and higher into a medium which constantly becomes thinner and lighter. Were there no weight to the airplane, the task would not be difficult and the machine could go as high as the balloon I mentioned—twenty-four miles. The airplane itself, its wheels, body, wings and tail, weigh considerable; add to this the weight of an engine, a supercharger, gasoline, oil, a pilot, barographs, all equipment, and the total will easily amount to a load of about one and one-fourth tons!

The lifting surfaces, or wings and tail, will carry that load at sea-level without much effort, and the engine and propeller will hum along with their greatest strength, developing the maximum power. But when the high altitudes are reached, the wings have less lift and the engine has less horsepower, until finally no more height can be attained. The *Apache* takes off from the ground with a run of about seventy-five feet, and climbs at an angle of thirty degrees or better. No plane ever built can compare with her for climb; she will make the first 10,000 feet in about three and one-half minutes.

The rate of climb is great until the plane reaches about 5 miles. An engine, being very much like a man, begins to feel the lack of oxygen at that altitude, and suffers a loss in power. Naturally, the speed falls off somewhat and the wings lose some of their lift. It is not feasible to carry enough oxygen to feed the engine, but it is possible to increase the supply of air going to the carburetor by installing a supercharger. This device, which has such a high sounding name, is just an air pump; the engine drives it by a shaft and gears at such a speed that it forces air through the carburetor in about the same quantities as would normally be supplied at sea level.

Until the supercharger is put into operation, the power is low, but as soon as the pilot opens his control valve, the full 450 horsepower is again available. The plane will continue on and up. But finally the air becomes so rare that the supercharger cannot supply enough to keep the engine running at full speed, although not a great deal of power is lost. Even though the engine will run satisfactorily, the rarefied atmosphere will not afford a solid enough base from which the plane can push itself higher.

There are many reasons why the wings of a plane cannot be built larger, the increased weight necessary being the predominant one. If it were possible to build great areas into the wings without the addition of much weight, the altitude climbing problem would be greatly simplified. At any rate, these wings must be made as large as possible within the weight limitations. The *Apache's* wings are fairly large, and it may be practi-

(*Continued on page* 949)

# How High Can Man Fly?

(*Continued from page* 948)

cable to increase them; a study of the problem is being made at the present time.

I can say with a reasonable amount of assurance that man can go eight and one-fourth miles high. Have I made clear the reasons why he cannot go much higher? I am basing my opinion on the performance possible with the equipment available at the present time.

If we can solve the problems we are working on now, there is every probability that our altitude records will be exceeded by far. The most necessary things to do are to improve the materials of plane construction and obtain information on which to advance the general art of construction. If we can find some material in our searches that is lighter than steel or even duralumin, with which to build our engines, we shall develop mighty power plants, much lighter than the present ones. Who knows what the next year will show by way of discovery? Someone may find a method for making a magnesium alloy, magnesium being the lightest of known metals—a magnesium alloy that will serve our purposes much better than steel. Then we shall be able to use it in the manufacture of large, light wings.

Surely we shall, sooner or later, discover some means, no doubt by the use of fully-enclosed cabins to supply a sufficient amount of air to the pilot to permit him to breathe easily at any height.

All depends on the success of our experiments and the perseverance with which we attack the problems confronting us. In the Naval Aeronautic Organization, we intend to extend ourselves to the limit in the effort to add something each year to the "ceiling" of our planes, as well as to their other operating characteristics. I predict that other organizations throughout the world will be active in these endeavors also, and that someone in the next ten years will reach an altitude ten miles above the level of the sea.

THE END

IF you enjoy AIR WONDER STORIES you must read SCIENCE WONDER STORIES, its sister magazine. In SCIENCE WONDER STORIES you will find all of the good authors who write for AIR WONDER STORIES, and there are many stories that deal with aviation and, particularly, space flying and interplanetarian trips. Be sure to get the April issue now on all newsstands. Table of contents follows:

"The Evening Star"
By Dr. David H. Keller

"The Falling Planetoid"
By I. R. Nathanson

"The Return to Subterrania"
By Hart Vincent

"An Adventure in Time"
By Francis Flagg

*And Others*

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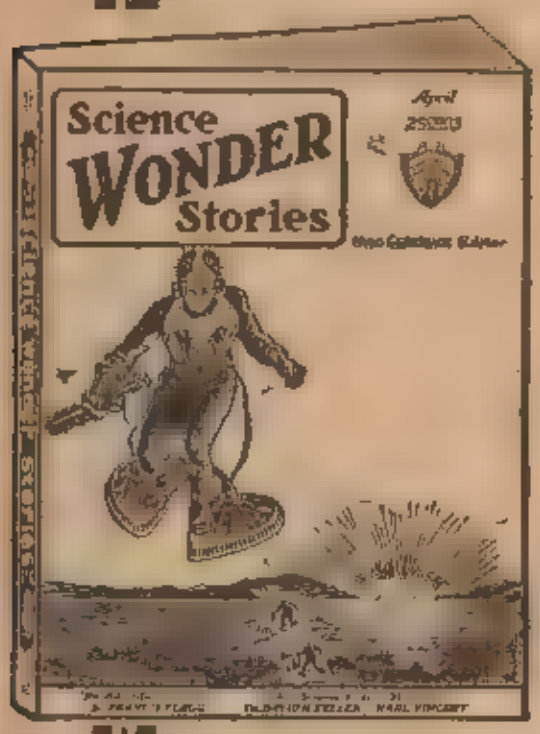


CAN man really travel into time, and, if so, how will he do it, and what might he find? In this most interesting story, AN ADVENTURE IN TIME, by Francis Flagg, many questions are answered in a remarkable manner. This versatile author of the "Land of the Bipos" gives another one of his imaginative creations. Since we printed "The Time Oscillator," several months ago, we have had a perfect flood of letters on various phases of the time traveling question; and surely it is one of the interesting and intriguing questions of the day.

**THE EVENING STAR**, by Dr. David H Keller. Dr Keller gives us now the promised sequel to his remarkable story, "The Conquerors." As we remember, at the end of "The Conquerors" the people of the earth had been saved temporarily, yet the danger of extinction still hung over them. In this story, Dr. Keller shows in his own inimitable manner the continuance of the efforts of Sir Harry Brunton to preserve the earthlings from the wrath of "The Conquerors."

**THE RETURN TO SUBTERRANIA**, by Harl Vincent. Those of our readers who read, "The Menace from Below," have clamored for a sequel to this story. Mr Vincent's picturization of the great hole, within the earth, in which existed many strange creatures, and ruled over by two iron-willed scientists, attracted considerable attention. In the sequel, an exceedingly well written and exciting story, we learn immensely more about that mysterious placed called "Subterrania."

**PRIZE CONTEST STORIES** — The three stories receiving Honorable Mention in the November 1929 Cover Prize Contest, will be published. These stories we have, of course, purchased from the authors at our regular space rates.

The table of contents also includes "The Falling Planetoid," by I R N manson, and other features as Science Questions, Air Science News of the Month, and The Reader Speaks.

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## AVIATION NEWS OPERATION

(Continued from page 944)

### Planes in U. S. Fly 75,000 Miles Daily

MORE than 75,000 scheduled miles are flown daily by planes on regular duty in the United States. During 1929 our airways system grew to a network covering about 35,[illegible] The improvement of airports, beacon lighting systems, radio and telegraph and weather reporting services has also grown [illegible] There are more than [illegible] of these landing fields and more than [illegible] preparing to establish them. Between airports [illegible] and radio beacons to keep them [illegible] when they are [illegible] or when they are flying through [illegible] Airway lighting systems are [illegible] during the past year and [illegible] 0 candlepower revolving searchlight beacons at ten-mile intervals along the routes.

### Italian Flyers Have Rigid Discipline

THE Royal Academy of Aviation, in Italy, imposes a régime of rigid military discipline upon students and requires, in addition to regular flight instruction, an educational program stretching over three years. The rules for entrance, moreover, are very rigid, and out of 920 applicants only 470 passed the severe medical test, while not more than 265 were admitted. The academy was founded in 1923.

The practical training, which is broken at long intervals by short vacations, is intensive and includes military exercises, gymnastics, training in seamanship, cycling, rowing, motor cycling, [illegible] signaling, office routine, [illegible], pistol, rifle, and machine gun firing, [illegible] and all kinds of sports. Land army practice, flying, naval cruising, submarine and torpedo practice, airplane and hydroplane observation flying, and aerostatic and dirigible principles and flying. The program of studies is similar to that at a university.

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**"The Stone from the Moon"**
**By Otto Willi Gail**
**"The Ape Cycle"**
**By Clare Winger Harris**
**"Via the Hewitt Ray"**
**By M F. Rupert**
**"The Thought Materializer"**
**By F. R. Long**
**"Within the Planet"**
**By Wesley Arnold**
**"The Mad Destroyer"**
**By Fletcher Pratt**

### Glider Successfully Launched From Dirigible

IT has been demonstrated that the glider has an important place in military aeronautical tactics with airships. Lieutenant Ralph S. Barnaby, the Navy's only glider pilot, has made a perfect descent from the great dirigible *Los Angeles*. The descent took twelve minutes, and was made from a height believed to be 2,000 feet, although the Navy has not made public the exact figures. The method by which the glider was released from the airship is also a Navy secret, but the method used was similar to the gear used to release bombs.

The glider flight itself was made quite easily and the landing was perfect. An airship can carry several gliders, the weight of which will be negligible in comparison to that of airplanes and these gliders can be used as life-saving devices or as observation units. The light weight and the maneuverability of the machines add greatly to their usefulness.

(Continued on page 951)

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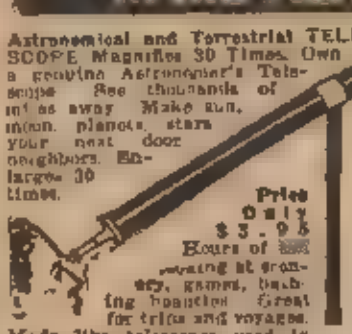

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# AVIATION NEWS
## GENERAL
(Continued from page 950)

### Lists 4 Great Events in 1929 Aviation

THE four outstanding achievements of the Army Air Corps have been listed by the War Department. These are: Perfection of chemical cooling for airplane motors; the death knell of the famous Liberty motors, the rapid advancement in the use of air-cooled motors and the development of new types of fighting craft in the two-seat pursuit planes, three-place twin-motored observation planes and the heavy bombardment bombers. Through the development of chemical cooling and the resulting reduction in the size of the motor required great advantages have been obtained.

### Airline Operators Desire Government Aid

GRAHAM B. GROSVENOR, president of Aviation Corporation, one of the largest organizations in its industry, has stated, in his forecast for the year 1930, that government aid to aviation is logical, and that it should be extended. He mentions the fact that other forms of transportation have received, and still receive, a great deal of assistance from the government. 'A substantial part of these aids seem to lie within the province of the Federal and State governments in the creation and maintenance of a suitable network of airways,' said Mr. Grosvenor, 'in the greater utilization of air mail, a governmental business, and in the substantial support and expansion of the air transportation companies which will make them operate economically sound.' The executive says that the airplane and stay gained through the [illegible] of the past year in airways, airports, radio service and through aerial surveys and greater agricultural developments and the waterways have all received early substantial government assistance.

### Snow and Ice No Obstacle to Arctic Pilots

GEORGE GARDNER, writing in *The New York Herald Tribune*, comments on the "real cold-weather aviators" for whom snow and ice have no terrors. Ordinary flyers are discouraged by the snow that falls regularly in temperate zones, but arctic pilots consider snow and ice part of their natural surroundings, and have learned to adapt their methods of flying to the unusual conditions. They use skis instead of wheels, and they have learned the tricks of taking off and landing with this equipment. In addition, they have to employ devices to keep the oil from freezing in the feed pipes, and to start and warm the engine.

### Colored Light Signals to Guide Planes

FLASHING lights spelling messages to aviators in the air and comprising a system of signals as complete as the block signal systems used by the railroad companies, will control all airplanes operating from a new airport near Alhambra, California. The lights are to be operated by electricity from a glass tower atop the passenger depot. From this tower, dispatchers equipped with binoculars will be able to watch the surrounding horizon for fifty miles or more. Every departing plane will be moved to the depot line where it will be halted by a red light.

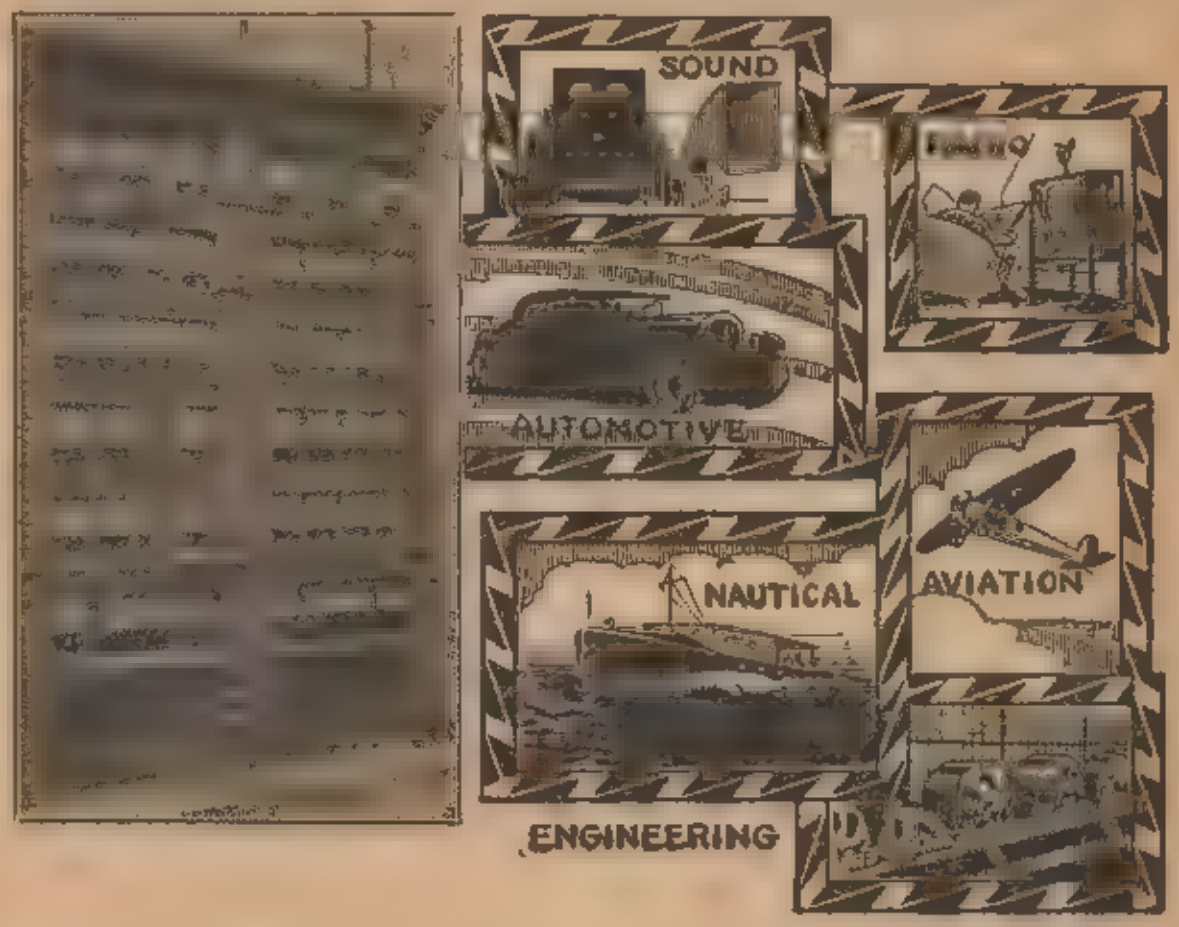
### Plans 15-Hour Flight to Paris

COLONEL HAROLD F. HARTNEY, commanding officer of the First Army Pursuit Group during the World War, and an ace, has worked out details for a 15-hour flight to Paris, according to Sherman B. Allen, writing in the *New York Herald Tribune*. Colonel Hartney intends to fly eastward over the city, as westerly winds exist at high altitudes, and with the aid of these winds high-speed planes, he hopes, can attain an average speed of [illegible] miles an hour.

The plans call for the use of a powerful supercharged engine in a plane that will attain a speed of 200 miles an hour at an altitude of 20,000 feet. The wind at an altitude of four miles will give an additional speed of fifty miles an hour. The plane would be the ordinary high-speed monoplane equipped with the engine mentioned, with oxygen tanks and with instruments for transoceanic navigation. In addition, the cabin of the plane will require heating, and insulation against the cold of high altitudes. The plane must be equipped with a propeller which will be efficient at five miles, and the plane will of necessity have to be refueled in the higher regions because it will be unable to leave the ground with a load of fuel.

Continued on page 952


"ELECTRICAL OPPORTUNITIES"

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SEE PAGE 942
4-30

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### What Art Buyers Say

An Art Editor writes: "Those furnishing names of [illegible] will be given [illegible] opportunity to submit drawings." Another writes: "We are glad to send a prospect." A Magazine Publisher writes: "We have purchased drawings from your graduates and [illegible]."

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# AVIATION NEWS
## GENERAL

(Continued from page 951)

### Draft New Rules for Air Safety

MAJOR CLARENCE M. YOUNG, Assistant Secretary of Commerce for Aeronautics, has announced that new air safety regulations are to be promulgated very shortly. These will be designed to prevent such accidents as those which occurred recently, and in which a number of persons lost their lives. The requirements—aimed especially at air transport—will include two-way radio communication between craft in flight and stations on the ground, and adequate ground organizations and facilities for the proper handling, maintenance, and operation of the aircraft. The new regulations will be flexible, in order to keep pace with the rapid progress of aviation. This will obviate the necessity for new legislation. In addition, the routes over which the transport planes fly will be provided with adequate airports, and there will be no long stretches of wild territory upon which a plane may be forced to descend. There will be special provisions for night flying.

### Advocates Glider Training

IN an editorial contributed to *Air Transportation* for January 18, 1930, Clyde V. Cessna, President of the Cessna Aircraft Company, says "Teach them to crawl before they walk." By this he means that learning to fly is too much of a job for the average individual who has not made adequate preparation for it. The best method is to develop glider flying, especially among the youth of the nation, for it is much easier to learn to fly a plane after one has been trained in a glider than it is to learn by using a plane alone. Gliding, according to this expert, is the best means of promoting air-mindedness and [illegible] flying activity on a sound basis. "The infant must crawl before he can walk but, after he has crawled awhile, the yearning to walk becomes overwhelming and the first steps are taken. Flying in a glider can be compared to crawling. It is purely sport, and the glider itself is a plaything compared to the airplane. Yet each one who flies for a time in a glider begins to have a desire to pilot a more powerful machine, and thus he begins to fly a real airplane."

### Seeks Altitude Mark With Artificial Lung

LIEUTENANT APOLLO SOUCEK, who has made and lost the world's altitude record, will try to recapture the title with the aid of a new, hand-operated, auxiliary lung to help him breathe. The machine used will be the same Wright *Apache* in which his record of 39,140 feet was made. Soucek feels that the additional oxygen supply is all that he needs to exceed the mark set last summer by the German flyer, Newhofen, who made a flight of 41,760 feet.

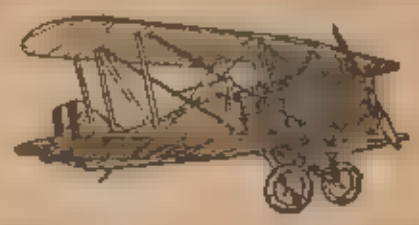
The new breathing apparatus consists of three bottles for "bone dry" oxygen, a two-hours' supply; a system of copper pipes and rubber tubing, and an "exhaust" tube that is closed with [illegible] valve at the [illegible] stops the flow of oxygen from the lungs outward. Passing over the pilot's seat the exhaust tube is connected to a casing enclosing the supply tubes running through the dashboard to the oxygen supply [illegible] mask at the passenger. The apparatus worked perfectly at 37,000 feet.

### Pursuit Planes Will Train at 5-Mile Altitude

FRANCIS D. WALTON, in the *New York* [illegible] tells of the method of training whereby [illegible] worked out at Rockwell Field, Calif., by the Army Air Corps. The aerial fighters will do their training at an altitude of 25,000 feet, which is very high for ordinary flight. The combat fighters will be trained in actual war maneuvers far above the "service ceiling" of most standard planes, and in a rarefied atmosphere which presents a whole series of unique hazards and dangers. The altitude record is almost 20,000 feet above the 25,000 foot level but the practice of training fighters at that height has never before been attempted.

The 95th Pursuit Squadron, which has its base at Rockwell Field, San Diego, Calif., will carry out the dangerous maneuvers. The planes will be Boeing P-12s, employing superchargers and powered with 400-H.P. *Wasp* engines. Full military load will be carried, as [illegible] For the type of plane used [illegible] used in the tactics, since one of the ways a plane gains speed in combat is by diving, and in the thin air of the upper levels, the machines will drop very quickly. Additional difficulties will be presented by the fact that pilots will wear bulky clothing to keep them from freezing, and that their reactions are slower than at ordinary levels. At 25,000 feet the temperature is usually about 30 below zero, Fahrenheit.


# Model Airplane Builders



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IN THE APRIL ISSUE OF

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## NEW SCIENTIFIC WONDER
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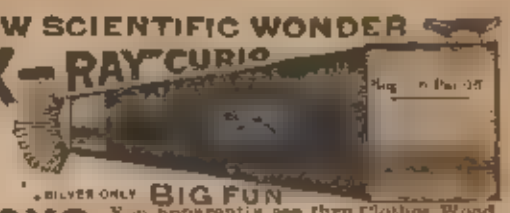

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AIR WONDER STORIES
98 Park Place New York, N. Y.

## THE READER AIRS HIS VIEWS

(Continued from page 947)

### The Scienceers

ALLEN GLASSER, 1981 Forest Avenue, New York City, N. Y., writes us that a new science club, the Sci-Fi Novelists, was formed in December 1929. All of the members are ardent readers of the Gernsback publications. "Anyone over sixteen, regardless of race, creed, sex, or color, is eligible to membership, provided he or she is in sympathy with the purpose of the club." Since regular weekly meetings are held, the membership is necessarily restricted to residents of New York and its environs. All people interested are invited to write Mr. Glasser.

### Demented Geniuses

*Editor, AIR WONDER STORIES:*

Won't you please give us some more stories a little closer to the times, like "Freedom of the Skies" by Edsel Newton? Why don't you progress a little more accurately, and not get too far ahead of the times?

I live where I can often see a large airplane carrier, and from several experiences while watching it I see the enormous possibility of some great but demented conqueror stealing down upon the world as does the Grand Master of the Conqueror of the World, in "Freedom of the Skies." The world should take warning. Just how many actual crimes have been committed with airplanes is not known, but you can bet the racketeer realizes its advantages soon enough.

Give us some more stories by those authors who are rational enough in their predictions to maintain real interest. Tell Mr. Newton, I, among others, enjoyed the aspirin tablet incident.

RAY W. GORMAN
960 Ivy Ave.
San Francisco, Cal.

(We always insist that our authors make their stories real ones and that they base them on science which is not fantastic, but on what we know at present. Mr. Gorman has observed what we have known all along—that a demented scientific genius could wreak great havoc among the peoples of the earth. The *Saratoga*, which carries a great number of airplanes, may well be, as he says, a symbol of what one may expect in the event that any such power is released upon the world.—*Editor.*)

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### The Serial Question

*Editor, AIR WONDER STORIES:*

I have at present to read science stories as [illegible] especially Air Wonder Stories. I want to say I was disgusted with Frank [illegible] has been with us in short [illegible] every issue. [illegible] was [illegible] I would have enjoyed it much more if there had been no serial. I hate to miss part of a story as I am likely to miss all but one part. My compliments to Juve and Key and the others—even including George Allan England.

J. L. BURT,
Greenville, Mississippi.

(Mr. Burt's sympathy with Mr. Kelly has, we feel, more of a personal viewpoint than an altruistic feeling. If he were able to buy a copy each month, he would probably enjoy the serials as do other and more fortunate readers. However, we make sure to have a goodly number of good short stories in each issue, so that the non-serialists can enjoy their AIR WONDER STORIES. Everyone has liked Juve and Key. England has received a great deal of deserved praise for his remarkable story.—*Editor.*)

(Continued on page 954)

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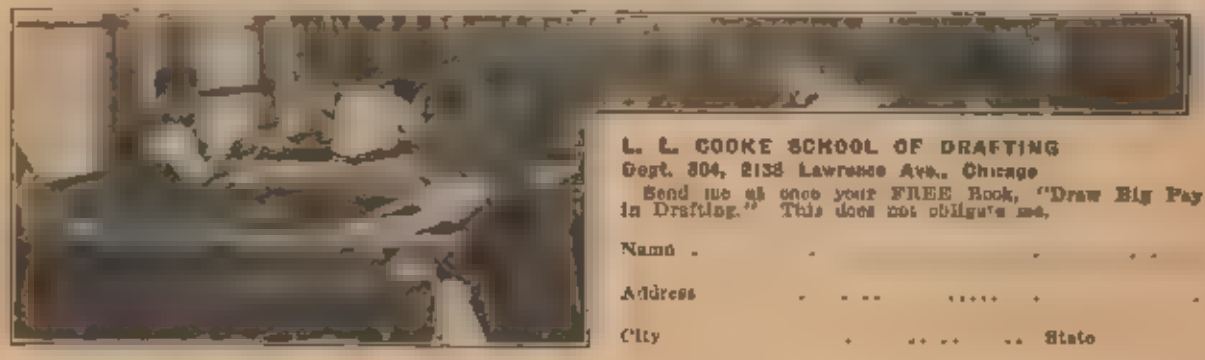

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## THE READER AIRS HIS VIEWS

(*Continued from page 953*)

### On Back Numbers

*Editor, AIR WONDER STORIES:*

Do you sell back numbers of SCIENCE WONDER STORIES and AIR WONDER STORIES? If so, will you sell me the issue of the magazine containing "Armageddon 2429"? It was published in January or February, 1929.

Here is my rating for some of the stories in your magazine. Those in the first group are excellent; in the second very good; in the third, good; in the fourth, fair; in the fifth, poor:

1. "The Flying Legion," "The Thunderer," "The Blue Demon."
2. "The Phantom of Galon," "Flannelcake's Invention," "Cities in the Air."
3. "Freedom of the Skies," "Liners of Space."
4. "The Red Ace," "The Flight of the Eastern Star."
5. None.

ROBERT DEATRICK,
47 N. Parkview Avenue,
Columbus, Ohio.

(Mr. Deatrick and other interested readers may obtain back numbers of AIR WONDER STORIES and SCIENCE WONDER STORIES and SCIENCE WONDER QUARTERLY at 25c each, by writing to the Stellar Publishing Company, 98 Park Place, New York City.

"Armageddon 2429" did not appear in our magazines. It was published in a magazine with which we have no connection.—*Editor.*)

### Where is the Club?

*Editor, AIR WONDER STORIES:*

Science Fiction Series, Science Fiction Classics, and Science Fiction—but where, oh where, is a Science Fiction Club? I'm with Mr. Lemerise of Chicago in wishing for a Science Wonder Club. And pins, too—it would be a great idea.

I read both your magazines from cover to cover, and I think there is only one word to describe them—GREAT!

I see by the latest issue that you finally printed an interplanetary story in AIR WONDER STORIES. Regarding this, I think other magazines in your field beat you all hollow.

Paul still holds his place as *the* illustrator. But he had a close second in another artist, who works for another magazine.

As to the Science Wonder Club: It should have different departments, for those who like different classes of science. And please—someone who is interested in microscopy, write to me. I'm "nuts" about it.

RICHARD THOMAS,
161 North Marshall Street,
Shamokin, Pennsylvania.

(Many science fiction clubs have been formed, the most recent of them being the Scienceers of New York, notice of which appears elsewhere. We suggest that Mr. Thomas get in touch with the Science Correspondence Club, which is the national organization of its kind. Information can be obtained from A. Raymond Palmer of 1431 38th St., Milwaukee, Wisconsin.—*Editor.*)

### Save the Family!

*Editor, AIR WONDER STORIES:*

I am writing this after having read your answer to Eli Meltzer in the February issue in regard to an AIR QUARTERLY. I do not favor an AIR QUARTERLY at this time for these reasons. The majority of your readers are reading all of your magazines, SCIENCE WONDER, AIR WONDER, SCIENCE QUARTERLY, SCIENTIFIC DETECTIVE and now an AIR QUARTERLY. If you bring that out we will also get that. It isn't the financial part that bothers me, but the time it takes to read them when I should be doing other things. It takes me about three evenings to read a magazine, making about a week and a half of evenings every month—not counting the SCIENCE QUARTERLY. A man's family should have part of his time, so you can see how little there is left for anything else.

No doubt some of the readers have plenty of time but there must be some like me. How about it? Of course if an AIR QUARTERLY comes out I shall support it, but isn't that a lot of magazines to start within a year—five and now maybe six?

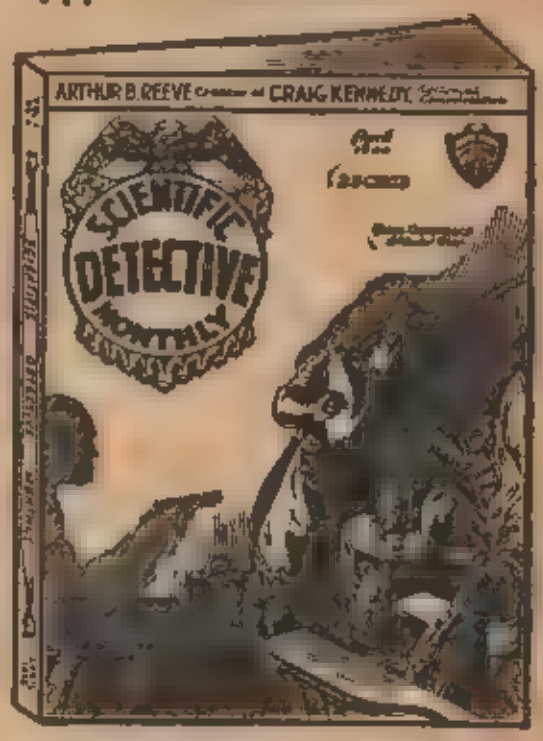
CLARENCE R. LIETZ,
1333 Seventh Ave. North,
Fargo, N. Dakota.

(This is a new angle of the Quarterly discussion. Many of our readers have complained of the past Fiction Group breaks. Mr. Lietz brings out his point clearly and we must now decide whether the readers of the monthly magazines should be asked to contribute some part of a man's time. Perhaps, after all, we will have to save the family from disruption.—*Editor.*)

(*Continued on page 955*)


# Intriguing!

## Scientific Crime Detection

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## THE READER AIRS HIS VIEWS

(Continued from page 954)

### 7,000,000 Miles Per Hour

*Editor, AIR WONDER STORIES*

I have been reading your magazine since it first appeared and I think it is about time I said something about it.

I like stories, long stories, and short stories. I think a good lineup for your magazine would be: One good four-part serial; two good long stories, two good short stories; and all the departments you have now.

Leave out all articles except those by Mr. Gernsback. This is a fiction magazine.

In "The Death's Head Meteor" I think I found an error. Please tell me if it is possible, even in the 26th century, and out in space, to travel at the rate of 7,000,000 miles per hour. Personally, I don't think so.

I am a model airplane enthusiast. What do you think of the idea of having a model building department for building models of future planes?

DAVIS CAMPBELL
Columbia, Alabama

(The reason why a speed of 7,000,000 miles per hour seems great is that we cannot rid our minds of terrestrial values. A being who travels through interplanetary space at inter-stellar speeds may think that we are practically motionless. We are retarded everywhere by a heavy wall of air. In inter-stellar space we would have no sense of great motion, for we would have no landmarks to tell us how fast we are going. In other words, all notions of speed are relative. We really must dismiss from our minds all our terrestrial conceptions of speed before we can really appreciate the possibilities in empty space where there is practically nothing to retard us. The earth itself travels 65,000 miles an hour in its orbit.

A model airplane contest is an excellent idea, but we doubt whether it would fit into the scope of our magazine.—*Editor.*)

### "'E Liked It All"

*Editor, AIR WONDER STORIES*

I see that you are trying to find new authors by that story contest. Good idea. Here's to bigger and better stories.

"The Vanishing Fleet" is really good. It had a lot of adventure in it along with the science. The science is really what the stories are for. Am I right? Encourage Juve for more stories because he can write them.

"Laners of Space" was good, too. There was a lot of excitement when the mad commander was heading for Mercury. He must have been crazier than a bat—even crazier than the author said.

"The Red Ace" wasn't so bad. It's funny, though, that the Red Ace would use a crude method of locomotion, with such a wonderful ship. "The Flying Legion," of course, is great stuff. And "Berlin to New York in One Hour" was fine. It'll be great if they get that ship worked out (and that isn't very far off).

CLARENCE CHANG,
417 Hester Street,
Stillwater, Oklahoma.

(We are almost sorry Mr. Chang couldn't find anything wrong with the issue he refers to. We always like to have constructive suggestions from readers, but this uniform praise is sweet to our ears.

Our story contests illustrate better than anything we could say, our policy of always finding new authors for our readers. We have developed several popular writers, and we shall develop more as time goes on.—*Editor.*)

### Down With Serials!

*Editor, AIR WONDER STORIES:*

AIR WONDER STORIES is good, but you'll have to admit that SCIENCE WONDER STORIES is better. One of the reasons is the usage of a serial murder. It is best one is, but you have always part that it may be continued for more money than do the writers in the air magazine.

True, you have some world writers, but even the best writers (or some of them) write for both magazines they seem to adapt themselves in SCIENCE WONDER STORIES.

I am writing this letter, however, mainly to urge a QUARTERLY for air stories, and about four interplanetary stories for each issue of your magazine. I just can't get enough of the interplanetary type of stories, and, if I read correctly, the majority of your readers feel the same way.

Down with serials! Print the whole story at once, or put it out as a Science Fiction Classic. Why not make the serial writers write short stories and then *Sequels*, instead of long-winded things, as they do now?

(Continued on page 956)

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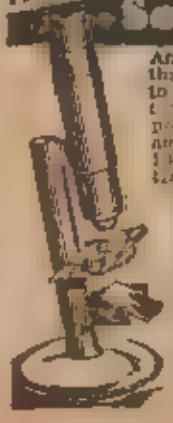

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## THE READER AIRS HIS VIEWS

(Continued from page 955)

Hendrik Dahl Juve is one of your few *good* authors, and the only thing I find great at George Allan England is his style of writing with long stories. Otherwise he is fine, and has some splendid ideas.

Why don't you try for some of Francis Flagg's stories if they come your way, or get him to write you some? He's a writer from whom we could all take lessons, and not be wasting our time. Gawain Edwards is also a fascinating writer.

The only fault I have to find with Repp is that he starts out with an idea that is a knock-out and ends his story lamely. I always feel, after reading one of his stories, that it isn't really finished, and is to be continued.

Another author who is well worth bidding for is W. M. Lenkin, Ph.D., whose ideas are very clearly conveyed to the reader, and who holds the reader's attention until the very end of the story. He has written some of the best things I have ever read.

I'll buy a QUARTERLY even if I do go broke.

WARREN WILLIAMS,
5450 Dorchester Avenue,
Chicago, Ill.

(Mr. Williams will be satisfied with the future issues of our magazine, for we will have more and more interplanetary stories as time goes on. And we disagree with him when he says our authors write better stories for our other magazine. As a matter of fact, each story must be excellent in itself before we print it, and we make it a rule that each new story sent in by an author must be an improvement, in some way, on the stories he has written before. It will be seen, therefore, that Mr. William's reaction, while it satisfies him, is not the result of anything we have done, or have left undone.

The aerial controversy has died down somewhat, but we find the Science Fiction Classics very popular, and people who wish their long stories in that form will find a great deal of enjoyment in them.

Francis Flagg has published several stories in our magazines. His "Land of the Bipos" appeared in the February issue of SCIENCE WONDER STORIES. And Mr. Flagg has another long story "An Adventure in Time" which will appear in the April SCIENCE WONDER STORIES. It is a splendid piece of work. Watch for it. —*Editor.*)

## The Mercator Projection

*Editor, AIR WONDER STORIES:*

I have enjoyed reading your magazine from the very first. You could not have a better writer of stories of science in the future than George Allan England. I found in an old chest a story written by him for *Collier's*, April 22, 1916, entitled "June 6, 2016." This is a short story which I am sure would make enjoyable reading for your subscribers.

I wish you would kindly answer a few questions. In the opening chapter of "The Flying Legion" there is a very fine description of the Master's room, and mention is made of a large space on the wall occupied by a "magnificent Mercator's Projection" of the world. Can you tell me what this is and where I could obtain one? I have always wanted something like this.

I also wish you could tell me the names of some of the other works of Mr. England. In "Who's who" I find a list of books under his name but the local library only has a book of verse, and I want the fiction. "The Flying Legion" is on the list, and I want to know whether this is published in book form.

R. RUSSELL MILLER,
1721 Emerson Avenue,
Dayton, Ohio.

(The Mercator Projection of the World is a map which shows the entire world on one plate, all represented on a flat surface, rather than in spherical perspective. One understands that there is a curve when parts of countries on the left side appear close to countries on the right—for example, Siberia is represented with part of Alaska near it, to show the relationship. The Mercator Projection is an old idea, and was originated by Gerhard Mercator, a Flemish mathematician (1512—1594). Technically, the projection is a system of making maps on which the meridians of a sphere (like the earth) are represented by parallel straight lines at equal intervals on the equator. The parallels of latitude are shown by lines perpendicular to the meridians, and at increasing intervals, so as to preserve the actual ratio between the increase of longitude and latitude at each point.

Our reprints of science fiction stories are very popular, and "The Flying Legion" has evoked a great deal of praise. We do not know whether this story has been published in book form. You may find out about the publishers of England's other books by writing to the publisher of his book of verse. It may be the same organization. —*Editor.*)


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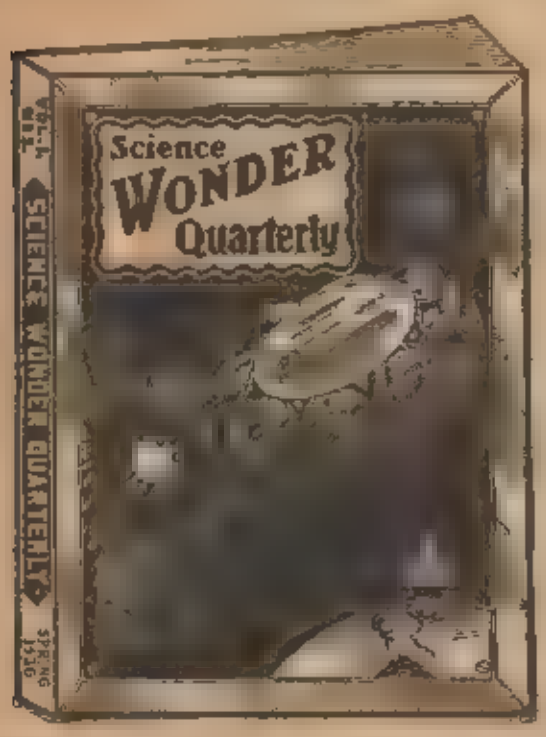


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# BOOK REVIEWS

## A NARRATIVE HISTORY OF AVIATION, by John Goldstrom. 319 pages, profusely illustrated, stiff cloth covers, size 6 by 8¼. Published by the Macmillan Company, New York. Price, $4.00.

This book presents an analogy between the development of the idea of flight and the development of the spirit of man. Beginning with the ancient myths concerning flying with the stories of Daedalus, Pegasus, and the flying horse of the Arabian Nights, it takes the reader to the present day, creating, in its course, an implied comparison between the expanding idea and theory of flight and the expanding activities of the human mind. The story of man's struggle toward the clouds is a parallel to man's rise from prehistoric slime to his present power in the world as we know it.

Mr. Goldstrom, who has flown thousands of miles himself, and who is acquainted with the leaders of the aviation industry, gives an engrossing history of recorded flight. He traces clearly the ceaseless urge to conquer the air, and his story naturally begins with the historic flight of the Wright brothers, one of whom has lived to see aviation advance to its present state.

The author discusses famous early flights, aviation and the world war, the air mail system, European air transport; the transoceanic flights, record round-the-world flights, the aerial polar explorations, the feats of Lindbergh and those who followed him, women in aviation, recent progress, and future developments. There is also an appendix listing the official world records for speed, duration, altitude, distance, and so forth, and this will be found most useful in settling questions which arise in daily discussions of aviation. We can recommend *A Narrative History of Aviation* as one of the best books of its particular type.

---

## THE AUTOMOTIVE MECHANIC'S HANDBOOK, by C. T. Schaefer. 310 pages, profusely illustrated, limp leather covers, size 4¼ by 7. Published by Harper & Brothers, New York. Price, $4.00.

This book by the former managing editor of the *Automobile Digest* is a reference work which should be widely used. The author is a member of the Society of Automotive Engineers, and an associate member of the American Society of Mechanical Engineers; he is well known as an authority on automotive matters, and he presents a handbook on motor vehicle care and maintenance which may be considered complete for all practical purposes. The book not only covers the usual motor and mechanical difficulties, but it gives reasons for them as well, and by demonstrating how the operator can find the cause of the trouble, as well as its location, it instructs him in the fundamental principles of automotive vehicles and also, as far as the motors are concerned, in aircraft.

The keynote of the entire elaborate work lies in the first chapter, which is sub-titled: "Diagnose Trouble with a System." The author proceeds in logical fashion from one major difficulty to another, and gives instructions for testing weaknesses in various parts of the car, and the means whereby the troubles may be rectified. In the first chapter is to be found a complete "trouble chart" which is amplified in the following sections of the book. For emergency use, however, the trouble chart is indispensable, since it covers every point of the car that is likely to cause difficulty, suggests easy tests for the determination of the trouble, and gives terse instructions for the immediate repair of the parts in question—if they can be repaired without the aid of a garage staff. By using the chart consistently, the driver of an automobile will learn better, perhaps, than in any other way, the direct causes for his annoyances; and he will learn to avoid them.

There are engine, valve, and ignition tests for various types of American cars. With the exception of the Auburn, the Chevrolet, the Locomobile, and a few others, the list is complete. The higher priced European cars—the Rolls-Royce, Minerva, Isotta Fraschini and

(Continued on page 958)


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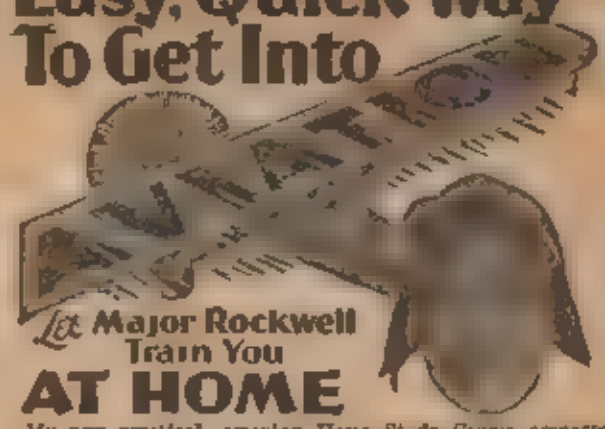

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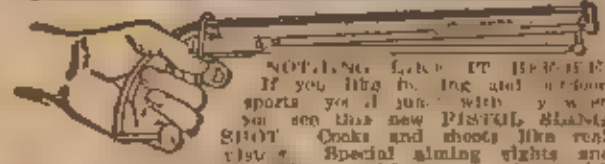

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## BOOK REVIEWS

(Continued from page 957)

Hispano-Suiza—are not mentioned, since it is assumed that owners of these cars never diagnose their own automotive troubles.

The volume covers, in an intensely practical fashion, the necessary parts of an operator's store of every-day knowledge—the location and diagnosis of engine and mechanical troubles, the reconditioning of the engine, the inspection and adjustment of the electrical, fuel, and lubricating systems; the cooling system; and the other important mechanisms of the car: the front axle and steering devices, and the rear axle and brakes. In addition, there is a chapter on reconditioning standards for the engine and chassis units, and one on shop practice, the latter including a definition of the terms used in repair work, and a detailed explanation of tools and testing devices. An appendix of miscellaneous data will save a great deal of time in making computations, and the 152 diagrams and photographs which illustrate the book make clear the points to be explained.

We cannot give a complete description of the mine of material contained in *The Automotive Mechanic's Handbook;* but it is certain that, if the book it the first of its kind, as the author states, it deserves to become standard.

---

### FALCONS OF FRANCE, by Charles Nordhoff and James Norman Hall. 332 pages, illustrated, stiff cloth covers, size 5¾ by 8½. Published by Little, Brown, and Company, Boston. Price, $2.50.

The co-authors of this book were aviators during the World War in squadrons of the famous Lafayette Flying Escadrille. They took part in many adventures in the air, and brought down many German planes in single combat and in fighting combats in which several machines were engaged on each side. The book itself takes the form of a novel which is in reality an autobiography of the authors, or rather an account of the activities of their organization. Charlie Selden, a wealthy young American, longs for an opportunity to engage in the war and the opportunity comes for him to join the Lafayette Flying Corps. He does so, and meets another American with motives similar to his. They become friends, and the reader follows them through their course of training and into the conflict itself. The realization grows upon them, and upon the reader as well, that war is not all glory and sky-larking, but that it is a horribly wearing and nauseating affair.

The authors (who tell the story in the first person) give all the details of the life of an aviator during the war, and through the pages of the book march such great figures as those of Luffbery and Guynemer, the latter being credited with having brought down about seventy enemy planes. There is a capture, and we are given a view of a German prison camp. Of course, the end of the war finds the hero and his friend intact, and covered with glory. But the impression the reader carries away is the impression the authors wish to give him—an understanding of the magnificent spirit that animated the members of the Lafayette Escadrille.

---

### APPLIED AERIAL PHOTOGRAPHY, by Captain Ashley C. McKinley. 341 pages, illustrated, stiff cloth covers, size 6 by 9¼. Published by John Wiley & Sons, Inc., New York. Price, $5.00.

Captain McKinley has won fame as the official aerial surveyor of the Byrd Antarctic Expedition. His book is the work of an expert, and it covers a field on which there is very little available material. Consequently, it may be regarded as the first standard modern volume on aerial photography. The author presents a thoroughly practical working knowledge of modern aerial cameras, photographic processes, [illegible] photographic lenses, aerial photography by [illegible] and many other interesting topics. The last chapter in this type of survey gives [illegible] some actual work in its own laws and modern [illegible] system. Mr. McKinley's book [illegible] three parts: "Taking Aerial Photographs," "Using the Photograph" and "Mapping with or from the Photograph." In addition there are sections on "Aerial Surveys" by A. M. Narraway, Chief Aerial Surveys Engineer Department of the Interior, Canada. There are a number of fine photographs in the volume which [illegible] enhancing its value as a text book and reference work.


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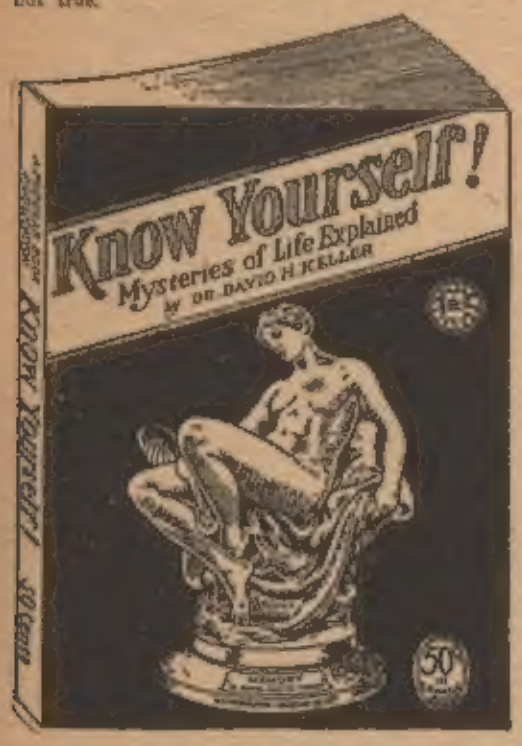


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# The Man I Pity Most

POOR OLD JONES. No one had any use for him. No one respected him. Across his face I read one harsh word—FAILURE. He just lived on. A poor worn-out imitation of a man, doing his sorry best to get on in the world. If he had realized just one thing he could have made good. He might have been a brilliant success.

There are thousands and thousands of men like Jones. They, too, could be happy, successful, respected and loved. But they can't seem to realize the one big fact—that practically everything worth while living for depends upon STRENGTH—upon live, red-blooded, he-man muscle.

Everything you do depends upon strength. No matter what your occupation, you need the health, vitality and clear thinking only big, strong, virile muscles can give you. When you are ill the strength in those big muscles pulls you through. At the office, in the farm fields, or on the tennis courts, you'll find success generally depends upon your muscular development.

## Here's a Short Cut to Strength and Success

"But," you say, "it takes years to build my body up to the point where it will equal those of athletic champions." It does if you go about it without any system, but there is a scientific short cut. And that's where I come in.

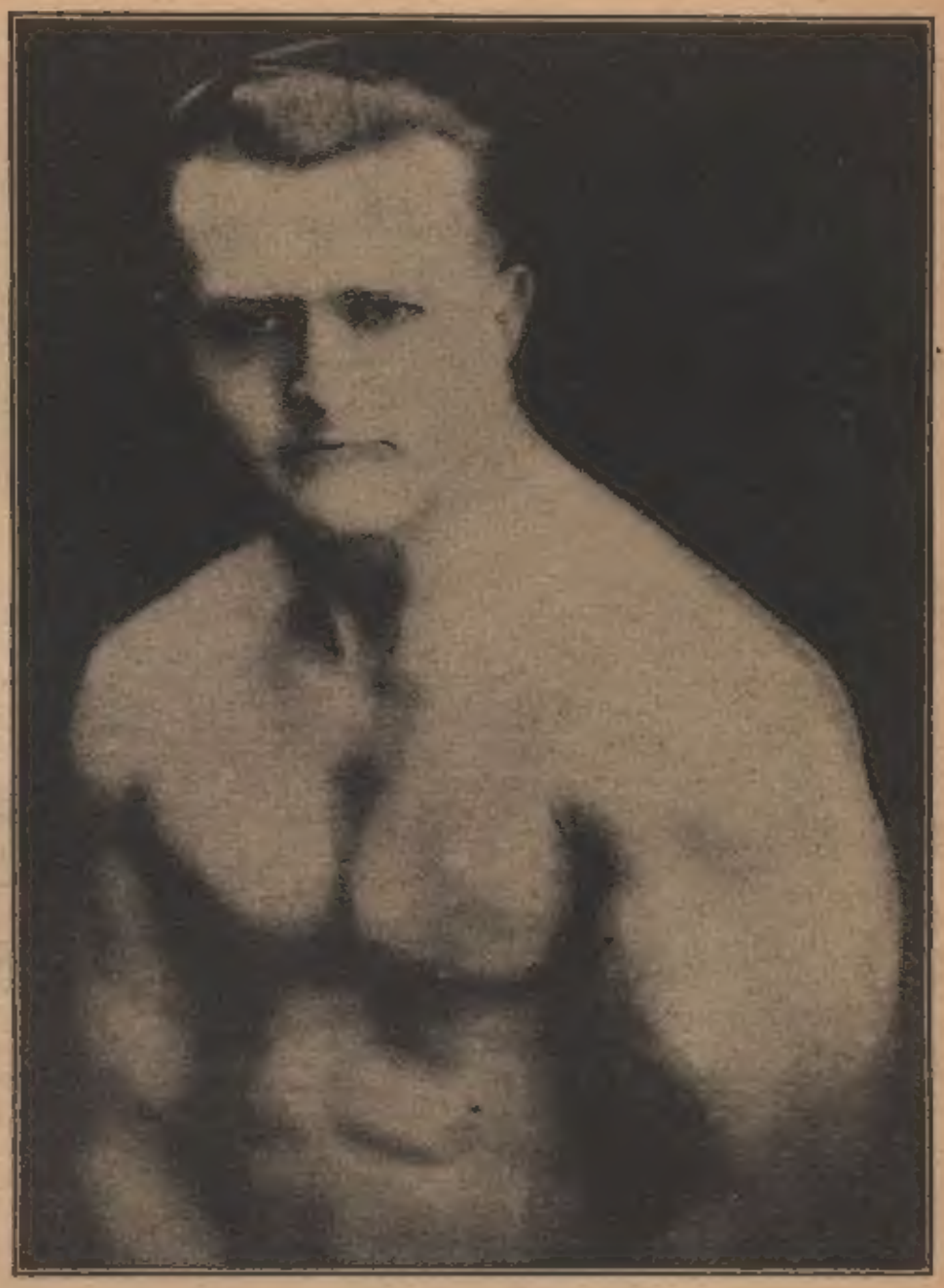
## 30 Days Is All I Need

In just 30 days I can do things with your body you never thought possible. With just a few minutes' work every morning, I will add one full inch of real, live muscle to each of your arms, and two whole inches across your chest. Many of my pupils have gained more than that, but I GUARANTEE to do at least that much for you in one short month. Your neck will grow shapely, your shoulders begin to broaden. Before you know it, you'll find people turning around when you pass. Women will want to know you. Your boss will treat you with a new respect. You'll look ten years younger, and you'll feel like it, too. Work will be easy. As for play, why, you realize then that you don't know what play really means.

## I Strengthen Those Inner Organs, Too

But I'm not through with you. I want ninety days in all to do the job right, and then all I ask is that you stand in front of your mirror and look yourself over.

What a marvelous change! Those great square shoulders! That pair of huge, lithe arms! Those firm, shapely legs! Yes sir. They are yours, and they are there to stay. You'll be just as fit inside as you are out, too, because I work on your heart, your liver—all of your inner organs, strengthening and exercising them. Yes, indeed, life can give you a greater thrill than you ever dreamed. But, remember, the only sure road to health, strength and happiness always demands action.



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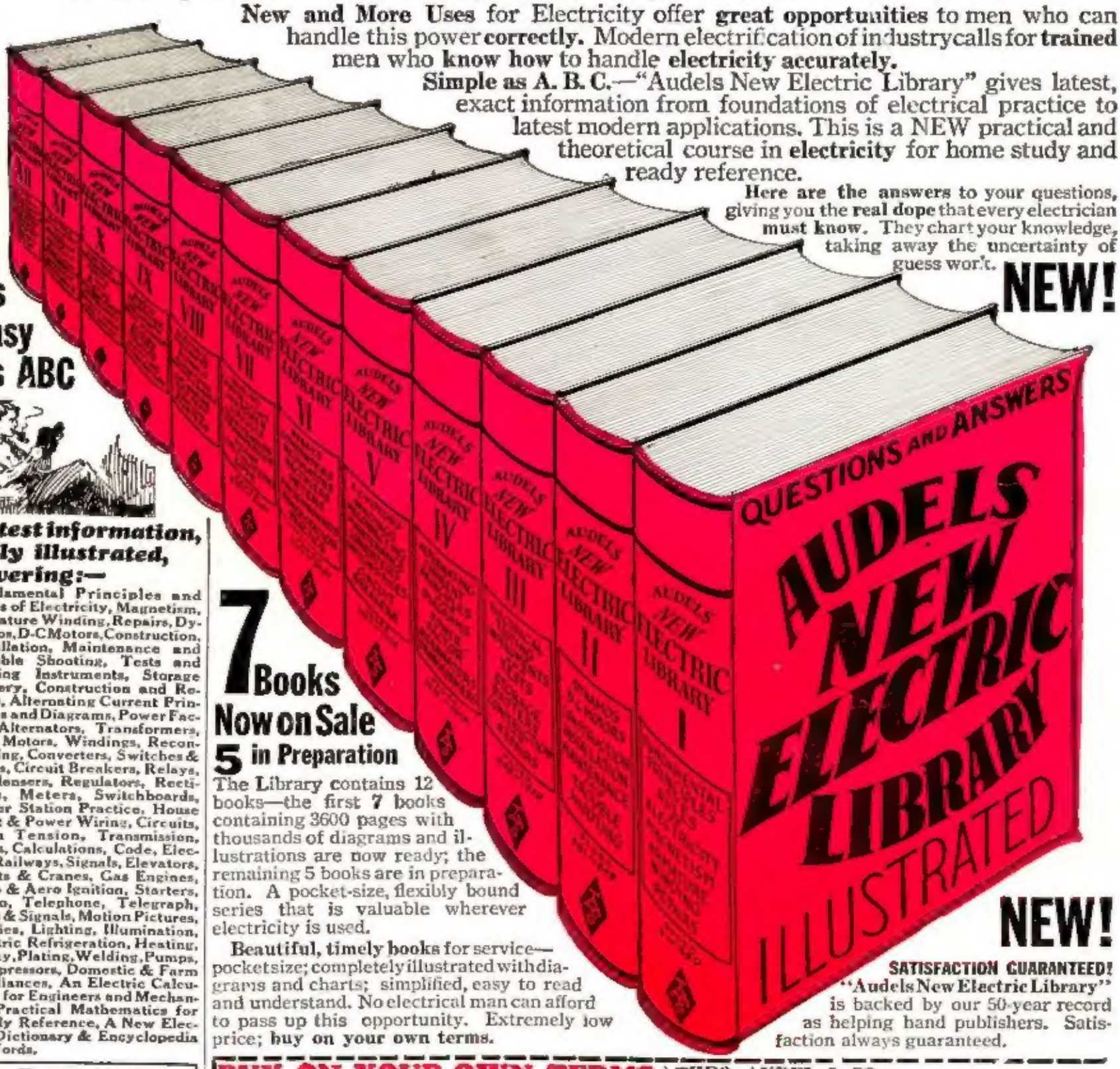


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